

70166USNP.ST25  
SEQUENCE LISTING

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<120> Nucleic Acid Molecules Encoding Proteins Essential for Plant Growth and Development and Uses Thereof

<130> 70166USNP

<150> US 60/423,519  
<151> 2002-11-04

<160> 73

<170> PatentIn version 3.1

<210> 1

<211> 2007

<212> DNA

<213> Arabidopsis thaliana

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<221> CDS

<222> (1)..(2007)

<223>

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 580 585 590  
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 Gly Asn Val Trp Tyr Asp Met Ser Tyr Asp Asp Ala Ile Lys Gln Thr  
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 Ile Glu Lys Arg Lys Glu Gly Ser Thr Leu Ala Ser Gln Glu Glu Glu  
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&lt;211&gt; 668

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

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 Arg Ile Ser Leu Leu Pro Cys Arg Gly Phe Ser Ser Asp Glu Phe Pro  
 35 40 45  
 Val Asp Glu Thr Phe Leu Glu Lys Phe Gly Pro Lys Asp Lys Asp Thr  
 50 55 60



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Trp Glu Glu Ile Leu Thr Pro Glu Ala Asp Phe Ala Arg Lys Ser Leu  
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Asp Lys Pro Pro Pro Leu Glu Thr Ser Trp Ala Gly Pro Met Val Leu  
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Arg Gln Ile Pro Pro Arg Asp Trp Pro Pro Arg Gly Trp Glu Val Asp  
165 170 175

Arg Lys Glu Leu Glu Phe Ile Arg Glu Ala His Lys Leu Met Ala Glu  
180 185 190

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195 200 205

Ala Thr Val Asp Lys Met Cys Leu Glu Arg Phe Lys Val Phe Leu Lys  
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Gln Tyr Lys Glu Trp Val Glu Asp Asn Lys Asp Arg Leu Glu Glu Glu  
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Ser Tyr Lys Leu Asp Gln Asp Phe Tyr Pro Gly Arg Arg Lys Arg Gly  
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Met Val Cys Glu Gly Thr Val Thr Thr Leu His Leu Tyr Gln Gly Ala  
275 280 285

Phe Val Asp Ile Gly Gly Val His Glu Gly Trp Val Pro Ile Lys Gly  
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Asn Asp Trp Phe Trp Ile Arg His Phe Ile Lys Val Gly Met His Val  
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Lys Phe Asp Phe Pro Pro Ile Phe His Arg Asp Gly Asp Thr Asn Pro  
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Asp Glu Ile Arg Arg Asp Cys Gly Arg Pro Pro Glu Pro Arg Lys Asp  
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Pro Gly Ser Lys Pro Glu Glu Glu Gly Leu Leu Ser Asp His Pro Tyr  
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Glu Ala Tyr Tyr Lys Lys Thr Lys Leu Pro Lys Val Ile Leu Lys Thr  
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Ser Val Lys Glu Leu Asp Leu Glu Ala Ala Leu Thr Glu Arg Gln His  
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His Asn Lys Leu Met Met Glu Ala Lys Ala Arg Gly Glu Gly Tyr Lys  
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Ile Asp Lys Leu Arg Arg Asn Ile Glu Met Asp Glu Tyr Asp Phe Leu  
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His Trp Arg Arg Ser Leu Glu Glu Arg Glu Ala Leu Leu Arg Asp Ile  
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Ser Ser Arg Gln Ala Leu Gly Leu Pro Leu Glu Glu Pro Gly Arg Tyr  
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Lys Pro Gly Ser Phe Phe Gly Lys Asp Gln Tyr Asp Pro Thr Ser Ala  
545 550 555 560

Leu Tyr Gln Tyr Asp Tyr Trp Gly Glu Pro Lys Asn Ser Glu Ile Ser  
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565

575

Lys Gln Glu Arg Met Lys Asp Ala His Asn Lys Ser Ile Val Gly Lys  
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Gly Asn Val Trp Tyr Asp Met Ser Tyr Asp Asp Ala Ile Lys Gln Thr  
595 600 605

Ile Glu Lys Arg Lys Glu Gly Ser Thr Leu Ala Ser Gln Glu Glu Glu  
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Thr Glu Ser Glu Glu Glu Glu Glu Asp Asp Asp Asp Phe Asp Asp Phe  
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&lt;222&gt; (1)..(1161)

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cgt cac tct gtt atg gat gtt tcc ttc cat cca tca aaa tct ctg ctt 96  
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ttc act ggt tca gct gat gga gag ttg agg att tgg gat act att cag 144  
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cac cgt gca gtt tct tct gct tgg gct cat agt aga gca aat ggg gtt 192  
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50 55 60

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Cys Asn Ala Val Ser Tyr Ser Pro Asp Cys Glu Leu Met Ala Ser Ala	355	360	365	
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Ser Glu Asp Ala Thr Val Ala Leu Trp Lys Leu Tyr Pro Pro His Lys	370	375	380	
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&lt;213&gt; Arabidopsis thaliana

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Glu Ser His Ser Arg Gly Cys Asp Glu Gln Asp Gly Gly Asp Thr Cys  
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Asn Val Gln Ile Ala Asp Asp Ser Glu Arg Ser Glu Glu Asp Ser Gly  
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Leu Leu Gln Asp Lys Asp His Ala Glu Gly Thr Thr Phe Val Ala Val  
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Val Gly Glu Gln Pro Thr Glu Val Glu Ile Trp Asp Leu Asn Thr Gly  
 180 185 190

Asp Lys Ile Ile Gln Leu Pro Gln Ser Ser Pro Asp Glu Ser Pro Asn  
 195 200 205

Ala Ser Thr Lys Gly Arg Gly Met Cys Met Ala Val Gln Leu Phe Cys  
 210 215 220

Pro Pro Glu Ser Gln Gly Phe Leu His Val Leu Ala Gly Tyr Glu Asp  
 225 230 235 240

Gly Ser Ile Leu Leu Trp Asp Ile Arg Asn Ala Lys Ile Pro Leu Thr  
 245 250 255

Ser Val Lys Phe His Ser Glu Pro Val Leu Ser Leu Ser Val Ala Ser  
 260 265 270

Ser Cys Asp Gly Gly Ile Ser Gly Gly Ala Asp Asp Lys Ile Val Met  
 275 280 285

Tyr Asn Leu Asn His Ser Thr Gly Ser Cys Thr Ile Arg Lys Glu Ile  
 290 295 300

Thr Leu Glu Arg Pro Gly Val Ser Gly Thr Ser Ile Arg Val Asp Gly  
 305 310 315 320

Lys Ile Ala Ala Thr Ala Gly Trp Asp His Arg Ile Arg Val Tyr Asn  
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 340 345 350

Cys Asn Ala Val Ser Tyr Ser Pro Asp Cys Glu Leu Met Ala Ser Ala  
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Ser Leu  
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 Leu Val Val Ser Glu Lys Arg Arg Leu Gly Ile Ser Gly Val Asn Phe  
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 Pro Arg Lys Ile Lys Leu Lys Ile Thr Cys Phe Ala Ala Glu Arg Pro  
 35 40 45  
 cgc cag gag aaa cag aaa aag aag agt cag agc cag agc act agc gac 192  
 Arg Gln Glu Lys Gln Lys Lys Lys Ser Gln Ser Gln Ser Thr Ser Asp  
 50 55 60  
 gct gag gct gga gtt gac cct gtt ggg ttt ctc acc aga ctc gga att 240  
 Ala Glu Ala Gly Val Asp Pro Val Gly Phe Leu Thr Arg Leu Gly Ile  
 65 70 75 80  
 gct gac aga atc ttt gct caa ttt ctc cgg gaa agg cat aaa gct ttg 288  
 Ala Asp Arg Ile Phe Ala Gln Phe Leu Arg Glu Arg His Lys Ala Leu  
 85 90 95  
 aaa gac ctt aaa gat gag att ttc aaa cgc cat ttc gat ttc aga gat 336  
 Lys Asp Leu Lys Asp Glu Ile Phe Lys Arg His Phe Asp Phe Arg Asp  
 100 105 110  
 ttt gct tca gga ttt gag tta ttg ggg atg cat cga cat atg gaa cac 384  
 Phe Ala Ser Gly Phe Glu Leu Leu Gly Met His Arg His Met Glu His  
 115 120 125  
 cgg gtt gac ttt atg gac tgg ggt cca ggt tct cgt tat ggg gct ata 432  
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Ile	Gly	Asp	Phe	Asn	Gly	Trp	Ser	Pro	Thr	Glu	Asn	Ala	Ala	Arg	Glu		
145					150					155					160		
ggc	cta	ttt	ggc	cat	gat	gat	tat	ggg	tat	tgg	ttc	att	att	ctt	gaa	528	
Gly	Leu	Phe	Gly	His	Asp	Asp	Tyr	Gly	Tyr	Trp	Phe	Ile	Ile	Leu	Glu		
				165					170					175			
gat	aag	tta	aga	gag	ggt	gaa	gaa	cca	gat	gaa	cta	tac	ttt	cag	cag	576	
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Tyr	Asn	Tyr	Val	Asp	Asp	Tyr	Asp	Lys	Gly	Asp	Ser	Gly	Val	Ser	Ala		
		195					200					205					
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Glu	Glu	Ile	Phe	Gln	Lys	Ala	Asn	Asp	Glu	Tyr	Trp	Glu	Pro	Gly	Glu		
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225					230					235					240		
cag	atg	ttt	ggc	ccg	aac	agt	cca	caa	acg	tta	gaa	gag	ctt	gga	gat	768	
Gln	Met	Phe	Gly	Pro	Asn	Ser	Pro	Gln	Thr	Leu	Glu	Glu	Leu	Gly	Asp		
				245					250					255			
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Ile	Pro	Asp	Ala	Glu	Thr	Arg	Tyr	Lys	Gln	Trp	Lys	Glu	Glu	His	Lys		
			260					265					270				
gat	gac	ccg	cca	agt	aat	cta	cct	cca	tgc	gac	atc	att	gat	aaa	ggt	864	
Asp	Asp	Pro	Pro	Ser	Asn	Leu	Pro	Pro	Cys	Asp	Ile	Ile	Asp	Lys	Gly		
		275					280					285					
caa	gga	aag	cca	tat	gat	att	ttt	aat	gtc	gtg	aca	tct	cca	gaa	tgg	912	
Gln	Gly	Lys	Pro	Tyr	Asp	Ile	Phe	Asn	Val	Val	Thr	Ser	Pro	Glu	Trp		
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Thr	Lys	Lys	Phe	Tyr	Glu	Lys	Glu	Pro	Pro	Ile	Pro	Tyr	Trp	Leu	Glu		
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aca	cgt	aaa	gga	aga	aag	gca	tgg	ttg	caa	aaa	tat	att	cca	gct	gtt	1008	
Thr	Arg	Lys	Gly	Arg	Lys	Ala	Trp	Leu	Gln	Lys	Tyr	Ile	Pro	Ala	Val		
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cca	cat	gga	agc	aag	tat	aga	ttg	tat	ttc	aat	act	cct	gat	gga	ccg	1056	
Pro	His	Gly	Ser	Lys	Tyr	Arg	Leu	Tyr	Phe	Asn	Thr	Pro	Asp	Gly	Pro		
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Leu	Glu	Arg	Val	Pro	Ala	Trp	Ala	Thr	Tyr	Val	Gln	Pro	Glu	Asp	Glu		
		355					360					365					
gga	aag	caa	gct	tac	gca	att	cat	tgg	gaa	cct	tct	cct	gaa	gct	gca	1152	
Gly	Lys	Gln	Ala	Tyr	Ala	Ile	His	Trp	Glu	Pro	Ser	Pro	Glu	Ala	Ala		
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ttc gaa gaa ttt act aag aag gtc ctt cct cat gtg aaa aga gct gga Phe Glu Glu Phe Thr Lys Lys Val Leu Pro His Val Lys Arg Ala Gly 420 425 430	1296
tac aat gca atc cag ttg att ggt gtc cct gag cac aag gat tat ttt Tyr Asn Ala Ile Gln Leu Ile Gly Val Pro Glu His Lys Asp Tyr Phe 435 440 445	1344
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ggc acg cca gat gat ttc aaa cgg ttg gtt gat gag gca cat ggc cta Gly Thr Pro Asp Asp Phe Lys Arg Leu Val Asp Glu Ala His Gly Leu 465 470 475 480	1440
gga ctt ctt gtc ttt ttg gac atc gtg cat tct tat gca gca gct gat Gly Leu Leu Val Phe Leu Asp Ile Val His Ser Tyr Ala Ala Ala Asp 485 490 495	1488
cag atg gtt ggg ctt tct ctc ttc gat ggt tca aat gat tgc tat ttt Gln Met Val Gly Leu Ser Leu Phe Asp Gly Ser Asn Asp Cys Tyr Phe 500 505 510	1536
cat tat ggt aaa agg ggg cat cac aaa cac tgg ggc acc cgg atg ttc His Tyr Gly Lys Arg Gly His His Lys His Trp Gly Thr Arg Met Phe 515 520 525	1584
aaa tac ggt gat ttg gat gtt ctt cat ttt cta ata tca aat ttg aac Lys Tyr Gly Asp Leu Asp Val Leu His Phe Leu Ile Ser Asn Leu Asn 530 535 540	1632
tgg tgg att aca gag tat caa gtt gat ggt tac caa ttt cac tcg ctt Trp Trp Ile Thr Glu Tyr Gln Val Asp Gly Tyr Gln Phe His Ser Leu 545 550 555 560	1680
gcc tcg atg att tac acg cac aat ggg ttt gct tca ttt aac aac gat Ala Ser Met Ile Tyr Thr His Asn Gly Phe Ala Ser Phe Asn Asn Asp 565 570 575	1728
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ctc att ttg gcc aat gaa atc ctg cac gtt caa cat cca aat ata ata Leu Ile Leu Ala Asn Glu Ile Leu His Val Gln His Pro Asn Ile Ile 595 600 605	1824
aca att gct gag gat gca aca tat tac cct ggg ttg tgt gag cca gtt Thr Ile Ala Glu Asp Ala Thr Tyr Tyr Pro Gly Leu Cys Glu Pro Val 610 615 620	1872
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Glu	Met	Trp	Val	Ser	Leu	Leu	Asp	Asn	Val	Pro	Asp	Asn	Glu	Trp	Ser	
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Met	Ser	Lys	Ile	Val	Ser	Thr	Leu	Val	Ala	Asn	Lys	Glu	Tyr	Ala	Asp	
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cgt	tca	ttt	gct	gaa	atc	tta	ttc	ggg	gga	gtc	gat	aat	ggg	tct	cct	2112
Arg	Ser	Phe	Ala	Glu	Ile	Leu	Phe	Gly	Gly	Val	Asp	Asn	Gly	Ser	Pro	
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705					710					715					720	
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Arg	Leu	Ile	Thr	Phe	Thr	Ser	Gly	Gly	Arg	Ala	Tyr	Leu	Asn	Phe	Met	
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Ser	Gly	Val	His	His	His	Leu	Phe	Ser	Phe	Asp	Lys	Glu	Leu	Met	Asp	
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His	Val	Asn	Asp	Ala	Asn	Met	Val	Ile	Ser	Phe	Ser	Arg	Gly	Pro	Phe	
				805					810					815		
cta	ttt	atc	ttt	aac	ttc	cac	cca	tca	aat	tca	tat	gaa	aag	tat	gat	2496
Leu	Phe	Ile	Phe	Asn	Phe	His	Pro	Ser	Asn	Ser	Tyr	Glu	Lys	Tyr	Asp	
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gtc	ggg	gta	gag	gaa	gct	ggg	gaa	tat	acc	atg	ata	ctg	aac	tcc	gat	2544
Val	Gly	Val	Glu	Glu	Ala	Gly	Glu	Tyr	Thr	Met	Ile	Leu	Asn	Ser	Asp	
		835					840					845				
gaa	gta	aag	tat	ggg	ggg	caa	ggg	att	gta	aca	gaa	gac	cac	tat	ctt	2592
Glu	Val	Lys	Tyr	Gly	Gly	Gln	Gly	Ile	Val	Thr	Glu	Asp	His	Tyr	Leu	
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caa	cgg	tca	att	agc	aag	aga	att	gat	ggg	caa	aga	aat	tgc	tta	gag	2640
Gln	Arg	Ser	Ile	Ser	Lys	Arg	Ile	Asp	Gly	Gln	Arg	Asn	Cys	Leu	Glu	
865					870					875					880	
gtg	ttt	ttg	cct	agc	cgg	act	gcc	caa	gtt	tac	aag	ttg	acc	cgg	atc	2688
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<213> Arabidopsis thaliana

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Pro Arg Lys Ile Lys Leu Lys Ile Thr Cys Phe Ala Ala Glu Arg Pro  
35 40 45

Arg Gln Glu Lys Gln Lys Lys Lys Ser Gln Ser Gln Ser Thr Ser Asp  
50 55 60

Ala Glu Ala Gly Val Asp Pro Val Gly Phe Leu Thr Arg Leu Gly Ile  
65 70 75 80

Ala Asp Arg Ile Phe Ala Gln Phe Leu Arg Glu Arg His Lys Ala Leu  
85 90 95

Lys Asp Leu Lys Asp Glu Ile Phe Lys Arg His Phe Asp Phe Arg Asp  
100 105 110

Phe Ala Ser Gly Phe Glu Leu Leu Gly Met His Arg His Met Glu His  
115 120 125

Arg Val Asp Phe Met Asp Trp Gly Pro Gly Ser Arg Tyr Gly Ala Ile  
130 135 140

Ile Gly Asp Phe Asn Gly Trp Ser Pro Thr Glu Asn Ala Ala Arg Glu  
145 150 155 160

Gly Leu Phe Gly His Asp Asp Tyr Gly Tyr Trp Phe Ile Ile Leu Glu  
165 170 175

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Asp Lys Leu Arg Glu Gly Glu Glu Pro Asp Glu Leu Tyr Phe Gln Gln  
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Tyr Asn Tyr Val Asp Asp Tyr Asp Lys Gly Asp Ser Gly Val Ser Ala  
 195 200 205

Glu Glu Ile Phe Gln Lys Ala Asn Asp Glu Tyr Trp Glu Pro Gly Glu  
 210 215 220

Asp Arg Phe Ile Lys Asn Arg Phe Glu Val Pro Ala Lys Leu Tyr Glu  
 225 230 235 240

Gln Met Phe Gly Pro Asn Ser Pro Gln Thr Leu Glu Glu Leu Gly Asp  
 245 250 255

Ile Pro Asp Ala Glu Thr Arg Tyr Lys Gln Trp Lys Glu Glu His Lys  
 260 265 270

Asp Asp Pro Pro Ser Asn Leu Pro Pro Cys Asp Ile Ile Asp Lys Gly  
 275 280 285

Gln Gly Lys Pro Tyr Asp Ile Phe Asn Val Val Thr Ser Pro Glu Trp  
 290 295 300

Thr Lys Lys Phe Tyr Glu Lys Glu Pro Pro Ile Pro Tyr Trp Leu Glu  
 305 310 315 320

Thr Arg Lys Gly Arg Lys Ala Trp Leu Gln Lys Tyr Ile Pro Ala Val  
 325 330 335

Pro His Gly Ser Lys Tyr Arg Leu Tyr Phe Asn Thr Pro Asp Gly Pro  
 340 345 350

Leu Glu Arg Val Pro Ala Trp Ala Thr Tyr Val Gln Pro Glu Asp Glu  
 355 360 365

Gly Lys Gln Ala Tyr Ala Ile His Trp Glu Pro Ser Pro Glu Ala Ala  
 370 375 380

Tyr Lys Trp Lys Tyr Ser Lys Pro Lys Val Pro Glu Ser Leu Arg Ile  
 385 390 395 400

Tyr Glu Cys His Val Gly Ile Ser Gly Ser Glu Pro Lys Val Ser Thr  
 405 410 415

Phe Glu Glu Phe Thr Lys Lys Val Leu Pro His Val Lys Arg Ala Gly  
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Tyr Asn Ala Ile Gln Leu Ile Gly Val Pro Glu His Lys Asp Tyr Phe  
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Thr Val Gly Tyr Arg Val Thr Asn Phe Phe Ala Ala Ser Ser Arg Tyr  
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Gly Thr Pro Asp Asp Phe Lys Arg Leu Val Asp Glu Ala His Gly Leu  
 465 470 475 480

Gly Leu Leu Val Phe Leu Asp Ile Val His Ser Tyr Ala Ala Ala Asp  
 485 490 495

Gln Met Val Gly Leu Ser Leu Phe Asp Gly Ser Asn Asp Cys Tyr Phe  
 500 505 510

His Tyr Gly Lys Arg Gly His His Lys His Trp Gly Thr Arg Met Phe  
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Lys Tyr Gly Asp Leu Asp Val Leu His Phe Leu Ile Ser Asn Leu Asn  
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Trp Trp Ile Thr Glu Tyr Gln Val Asp Gly Tyr Gln Phe His Ser Leu  
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Ala Ser Met Ile Tyr Thr His Asn Gly Phe Ala Ser Phe Asn Asn Asp  
 565 570 575

Leu Asp Asp Tyr Cys Asn Gln Tyr Val Asp Arg Asp Ala Leu Met Tyr  
 580 585 590

Leu Ile Leu Ala Asn Glu Ile Leu His Val Gln His Pro Asn Ile Ile  
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Thr Ile Ala Glu Asp Ala Thr Tyr Tyr Pro Gly Leu Cys Glu Pro Val  
 610 615 620

Ser Gln Gly Gly Leu Gly Phe Asp Tyr Tyr Val Asn Leu Ser Ala Ser  
 625 630 635 640

Glu Met Trp Val Ser Leu Leu Asp Asn Val Pro Asp Asn Glu Trp Ser  
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Met Ser Lys Ile Val Ser Thr Leu Val Ala Asn Lys Glu Tyr Ala Asp  
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Lys Met Leu Ser Tyr Ala Glu Asn His Asn Gln Ser Ile Ser Gly Gly  
 675 680 685

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Arg Ser Phe Ala Glu Ile Leu Phe Gly Gly Val Asp Asn Gly Ser Pro  
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Gly Gly Lys Glu Leu Leu Asp Arg Gly Ile Ser Leu His Lys Met Ile  
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Arg Leu Ile Thr Phe Thr Ser Gly Gly Arg Ala Tyr Leu Asn Phe Met  
725 730 735

Gly Asn Glu Phe Gly His Pro Glu Arg Val Glu Phe Pro Thr Gln Ser  
740 745 750

Asn Asn Phe Ser Phe Ser Leu Ala Asn Arg Arg Trp Asp Leu Leu Glu  
755 760 765

Ser Gly Val His His His Leu Phe Ser Phe Asp Lys Glu Leu Met Asp  
770 775 780

Leu Asp Lys Ser Lys Gly Ile Leu Ser Arg Gly Leu Pro Ser Ile His  
785 790 795 800

His Val Asn Asp Ala Asn Met Val Ile Ser Phe Ser Arg Gly Pro Phe  
805 810 815

Leu Phe Ile Phe Asn Phe His Pro Ser Asn Ser Tyr Glu Lys Tyr Asp  
820 825 830

Val Gly Val Glu Glu Ala Gly Glu Tyr Thr Met Ile Leu Asn Ser Asp  
835 840 845

Glu Val Lys Tyr Gly Gly Gln Gly Ile Val Thr Glu Asp His Tyr Leu  
850 855 860

Gln Arg Ser Ile Ser Lys Arg Ile Asp Gly Gln Arg Asn Cys Leu Glu  
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Leu Arg Ile

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&lt;400&gt; 7

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cta ata ccc aaa tct caa aaa ttc cac act ctc caa tca ttt cgt aac	96
Leu Ile Pro Lys Ser Gln Lys Phe His Thr Leu Gln Ser Phe Arg Asn	
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Pro Asn Phe Ile Ser Ile Pro Lys Ile Ser Ala Ser Thr Asn Asn Pro	
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aca aca aca acg aat cgg tcg atc tcc gac gcg act aaa ttc gct aag	192
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Ser Val Leu Phe Ile Pro Pro Gly Val Glu Ile Glu Glu Leu Thr Asp	
65 70 75 80	
gat atg gtt ctt ccg ggt tca aat atc gta atc gga cct ttt gcg ggt	288
Asp Met Val Leu Pro Gly Ser Asn Ile Val Ile Gly Pro Phe Ala Gly	
85 90 95	
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aga gat tgt cct aaa gat gat cgt cct gag att gcg att ttg ggt cgt	384
Arg Asp Cys Pro Lys Asp Asp Arg Pro Glu Ile Ala Ile Leu Gly Arg	
115 120 125	
tct aat gtt ggc aag tct tcg ctt atc aat tgt ttg gtt cgt aag aaa	432
Ser Asn Val Gly Lys Ser Ser Leu Ile Asn Cys Leu Val Arg Lys Lys	
130 135 140	
gaa gtt gct ctt act tct aag aaa cct ggg aag act cag ctt ata aat	480
Glu Val Ala Leu Thr Ser Lys Lys Pro Gly Lys Thr Gln Leu Ile Asn	
145 150 155 160	
cac ttc ttg gtg aat aag agt tgg tac att gtg gat ttg cct ggt tat	528
His Phe Leu Val Asn Lys Ser Trp Tyr Ile Val Asp Leu Pro Gly Tyr	
165 170 175	
gga ttt gct aaa gtt tca gat gct gcg aaa aca gat tgg tct gcg ttt	576
Gly Phe Ala Lys Val Ser Asp Ala Ala Lys Thr Asp Trp Ser Ala Phe	
180 185 190	

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 Leu Ile Asp Ala Ser Val Pro Pro Gln Lys Ile Asp Leu Asp Cys Ala  
 210 215 220  
 aat tgg ctt ggt cgc aac aat gta ccg atg act ttc gtg ttt acg aaa 720  
 Asn Trp Leu Gly Arg Asn Asn Val Pro Met Thr Phe Val Phe Thr Lys  
 225 230 235 240  
 tgc gat aaa atg aaa gca acg aaa ggg aaa aga cct gat gag aac att 768  
 Cys Asp Lys Met Lys Ala Thr Lys Gly Lys Arg Pro Asp Glu Asn Ile  
 245 250 255  
 aaa gct ttc caa caa atc att aga gag aat ttt aaa gta cat cct cct 816  
 Lys Ala Phe Gln Gln Ile Ile Arg Glu Asn Phe Lys Val His Pro Pro  
 260 265 270  
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 275 280 285  
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&lt;211&gt; 300

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Pro Asn Phe Ile Ser Ile Pro Lys Ile Ser Ala Ser Thr Asn Asn Pro  
 35 40 45

Thr Thr Thr Thr Asn Arg Ser Ile Ser Asp Ala Thr Lys Phe Ala Lys  
 50 55 60

Ser Val Leu Phe Ile Pro Pro Gly Val Glu Ile Glu Glu Leu Thr Asp  
 65 70 75 80

Asp Met Val Leu Pro Gly Ser Asn Ile Val Ile Gly Pro Phe Ala Gly  
 Page 20



His Ser Gln Ile Lys Glu Val Glu Phe Val Lys Ser Ser Ala Arg Ala  
100 105 110

Arg Asp Cys Pro Lys Asp Asp Arg Pro Glu Ile Ala Ile Leu Gly Arg  
115 120 125

Ser Asn Val Gly Lys Ser Ser Leu Ile Asn Cys Leu Val Arg Lys Lys  
130 135 140

Glu Val Ala Leu Thr Ser Lys Lys Pro Gly Lys Thr Gln Leu Ile Asn  
145 150 155 160

His Phe Leu Val Asn Lys Ser Trp Tyr Ile Val Asp Leu Pro Gly Tyr  
165 170 175

Gly Phe Ala Lys Val Ser Asp Ala Ala Lys Thr Asp Trp Ser Ala Phe  
180 185 190

Thr Lys Gly Tyr Phe Leu Asn Arg Asp Ser Leu Val Cys Val Leu Leu  
195 200 205

Leu Ile Asp Ala Ser Val Pro Pro Gln Lys Ile Asp Leu Asp Cys Ala  
210 215 220

Asn Trp Leu Gly Arg Asn Asn Val Pro Met Thr Phe Val Phe Thr Lys  
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Cys Asp Lys Met Lys Ala Thr Lys Gly Lys Arg Pro Asp Glu Asn Ile  
245 250 255

Lys Ala Phe Gln Gln Ile Ile Arg Glu Asn Phe Lys Val His Pro Pro  
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&lt;222&gt; (1)..(2412)

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Thr	Ser	Ala	Gly	Gly	Pro	Pro	Val	Ser	Leu	Phe	Arg	His	Arg	Ile	Gln	
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cgc	ctc	aga	gct	tct	cat	ctc	cgt	gaa	ttc	tcg	aaa	tta	cgt	tta	aat	144
Arg	Leu	Arg	Ala	Ser	His	Leu	Arg	Glu	Phe	Ser	Lys	Leu	Arg	Leu	Asn	
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Phe	Pro	Leu	Ile	Arg	Ala	Asp	Arg	Arg	Phe	Leu	Gly	Asn	Ser	Asp	Ala	
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Pro	Ser	Cys	Ser	Thr	Cys	Ile	His	Ser	Leu	Val	Glu	Ser	Val	Ser	Glu	
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gag	ctc	gaa	tcc	atc	agc	aga	cgc	aag	gga	agc	cga	atg	aga	gtt	cgc	288
Glu	Leu	Glu	Ser	Ile	Ser	Arg	Arg	Lys	Gly	Ser	Arg	Met	Arg	Val	Arg	
				85					90					95		

gcc	agt	gta	aag	gtg	aaa	tta	aca	agc	tac	gga	gag	gtt	cta	gag	gat	336
Ala	Ser	Val	Lys	Val	Lys	Leu	Thr	Ser	Tyr	Gly	Glu	Val	Leu	Glu	Asp	
			100					105					110			

aag	cta	gta	aac	cag	gag	cta	gag	gct	ggg	ttg	ctt	ctg	gag	ttt	aag	384
Lys	Leu	Val	Asn	Gln	Glu	Leu	Glu	Ala	Gly	Leu	Leu	Leu	Glu	Phe	Lys	
		115					120					125				

aag	gac	gca	gac	aga	gtg	ttg	ttg	gca	gtt	ctt	cat	aga	cgt	gat	ggc	432
Lys	Asp	Ala	Asp	Arg	Val	Leu	Leu	Ala	Val	Leu	His	Arg	Arg	Asp	Gly	
	130					135					140					

aag	aag	aat	tgg	atg	gtg	ttt	gat	cag	aat	ggg	gtt	agt	tgt	tcc	atc	480
Lys	Lys	Asn	Trp	Met	Val	Phe	Asp	Gln	Asn	Gly	Val	Ser	Cys	Ser	Ile	
145					150					155					160	

aaa	cca	cag	caa	att	aca	tac	atc	gtc	ccg	aat	gtt	tat	aat	ttt	gat	528
Lys	Pro	Gln	Gln	Ile	Thr	Tyr	Ile	Val	Pro	Asn	Val	Tyr	Asn	Phe	Asp	
				165					170					175		

cat	aca	gga	ctt	act	gat	ttt	ctc	caa	agg	gct	caa	gat	aac	ttg	gat	576
His	Thr	Gly	Leu	Thr	Asp	Phe	Leu	Gln	Arg	Ala	Gln	Asp	Asn	Leu	Asp	
			180					185					190			

ccc	caa	ctg	ctt	gag	ttt	gct	tgg	atg	gag	tta	ctt	gag	aag	aac	aaa	624
Pro	Gln	Leu	Leu	Glu	Phe	Ala	Trp	Met	Glu	Leu	Leu	Glu	Lys	Asn	Lys	

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195	200	205	
cct gtg acc cca gaa gag tta gca gag atg ata tat ggt cgc gca gat Pro Val Thr Pro Glu Glu Leu Ala Glu Met Ile Tyr 220 Gly Arg Ala Asp	210	215	672
cct ctt gaa agc tat tgt gct cat ttt ttg cta tca caa gac gag ata Pro Leu Glu Ser Tyr Cys Ala His Phe Leu Leu Ser Gln Asp Glu Ile	225	230	720
tac ttt tct atc ttg gag tca aaa ggt tct cga tca ata tat agc cct Tyr Phe Ser Ile Leu Glu Ser Lys Gly Ser Arg Ser Ile Tyr Ser Pro	245	250	768
cgg cct act gaa cag gtg gaa gag ctt tta cga agg caa cgc gtg aag Arg Pro Thr Glu Gln Val Glu Glu Leu Leu Arg Arg Gln Arg Val Lys	260	265	816
gag gca gaa gat aaa gag ttt cag gag ttt att caa ttg ctg aag tct Glu Ala Glu Asp Lys Glu Phe Gln Glu Phe Ile Gln Leu Leu Lys Ser	275	280	864
gcc aag aag gca cct agt cac gcc aag ccc cct aaa tct tca tgg cta Ala Lys Lys Ala Pro Ser His Ala Lys Pro Pro Lys 300 Ser Ser Trp Leu	290	295	912
gct gat gat aaa gtc caa gat agg att ggc tca ctt gaa gct tat gcc Ala Asp Asp Lys Val Gln Asp Arg Ile Gly Ser Leu Glu Ala Tyr Ala	305	310	960
att gat gca tgg gca agc act gac cag cag aaa ttg gct gga acg ata Ile Asp Ala Trp Ala Ser Thr Asp Gln Gln Lys Leu Ala Gly Thr Ile	325	330	1008
tta aaa tcc atg ggg tta cag aaa acg tct gta tca gca cta aac ctt Leu Lys Ser Met Gly Leu Gln Lys Thr 345 Ser Val Ser Ala Leu Asn Leu	340	345	1056
ctc ata gat att gga tat ttt cct gta cat gtc aat ctt gaa ctg ctt Leu Ile Asp Ile Gly Tyr Phe Pro Val His Val Asn Leu Glu Leu Leu	355	360	1104
aag ctg aat ctt cca acc cac cac tca gaa gct atc act gaa gct gct Lys Leu Asn Leu Pro Thr His His Ser Glu Ala Ile Thr Glu Ala Ala	370	375	1152
gaa gct ctt ctt tca gaa tcg tct gat att gat gcg gtt agg agg att Glu Ala Leu Leu Ser Glu Ser Ser Asp Ile Asp Ala Val Arg Arg Ile	385	390	1200
gat ctc aca cac ttg aag gtt tat gca att gat gtt gat gag gct gat Asp Leu Thr His Leu Lys Val Tyr Ala Ile Asp Val Asp Glu Ala Asp	405	410	1248
gag ctt gat gat gcc ctc agt gca acg aga ttg cag gat gga cgg ata Glu Leu Asp Asp Ala Leu Ser Ala Thr Arg Leu Gln Asp Gly Arg Ile	420	425	1296
aag atc tgg ata cat gtt gct gat cct gct aga tat gtt aca cct ggg Lys Ile Trp Ile His Val Ala Asp Pro Ala Arg Tyr Val Thr Pro Gly	435	440	1344
agt aaa gtg gac aga gag gca agg aga agg gga act tct gtc ttt ctg			1392

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Ser	Lys	Val	Asp	Arg	Glu	Ala	Arg	Arg	Arg	Gly	Thr	Ser	Val	Phe	Leu	
450						455					460					
cca	acg	gct	act	tat	cca	atg	ttt	cca	gag	aaa	ctt	gcc	atg	gaa	gga	1440
Pro	Thr	Ala	Thr	Tyr	Pro	Met	Phe	Pro	Glu	Lys	Leu	Ala	Met	Glu	Gly	
465					470					475					480	
atg	agc	tta	aga	caa	gga	gaa	aac	tgt	aat	gct	gtc	tct	gtg	tct	gtt	1488
Met	Ser	Leu	Arg	Gln	Gly	Glu	Asn	Cys	Asn	Ala	Val	Ser	Val	Ser	Val	
				485					490					495		
gtc	ctg	cgt	tct	gat	ggc	tgt	att	aca	gaa	tat	tca	gta	gat	aat	tca	1536
Val	Leu	Arg	Ser	Asp	Gly	Cys	Ile	Thr	Glu	Tyr	Ser	Val	Asp	Asn	Ser	
			500					505					510			
atc	atc	aga	ccg	acc	tat	atg	ttg	acg	tat	gaa	agt	gct	tct	gag	ctg	1584
Ile	Ile	Arg	Pro	Thr	Tyr	Met	Leu	Thr	Tyr	Glu	Ser	Ala	Ser	Glu	Leu	
		515					520					525				
ctt	cac	ttg	aac	cta	gaa	gaa	gaa	gct	gaa	ctg	aaa	ttg	ctg	tct	gag	1632
Leu	His	Leu	Asn	Leu	Glu	Glu	Glu	Ala	Glu	Leu	Lys	Leu	Leu	Ser	Glu	
	530					535					540					
gca	gca	ttc	att	cgc	tct	cag	tgg	cgc	cgt	gaa	cag	ggt	gca	gtg	gac	1680
Ala	Ala	Phe	Ile	Arg	Ser	Gln	Trp	Arg	Arg	Glu	Gln	Gly	Ala	Val	Asp	
545					550					555					560	
aca	act	aca	cta	gaa	act	cgt	atc	aaa	gtg	gtg	aat	cct	gag	gat	cca	1728
Thr	Thr	Thr	Leu	Glu	Thr	Arg	Ile	Lys	Val	Val	Asn	Pro	Glu	Asp	Pro	
				565					570					575		
gaa	cct	ttg	ata	aat	ctc	tat	gta	gaa	aat	cag	gca	gat	cta	gcg	atg	1776
Glu	Pro	Leu	Ile	Asn	Leu	Tyr	Val	Glu	Asn	Gln	Ala	Asp	Leu	Ala	Met	
			580					585					590			
aga	ctt	gtc	ttt	gaa	atg	atg	att	ctt	tgt	ggg	gag	gtt	gta	gca	acg	1824
Arg	Leu	Val	Phe	Glu	Met	Met	Ile	Leu	Cys	Gly	Glu	Val	Val	Ala	Thr	
		595					600					605				
ttt	ggg	tct	cag	cat	aat	att	cca	ttg	cca	tat	aga	gga	cag	cca	cag	1872
Phe	Gly	Ser	Gln	His	Asn	Ile	Pro	Leu	Pro	Tyr	Arg	Gly	Gln	Pro	Gln	
	610					615					620					
tca	aat	att	gat	gta	tct	gca	ttt	gcg	cat	ctt	cca	gaa	gga	cca	gta	1920
Ser	Asn	Ile	Asp	Val	Ser	Ala	Phe	Ala	His	Leu	Pro	Glu	Gly	Pro	Val	
625					630					635					640	
cgt	tcc	tca	tcc	att	gtc	aaa	gta	atg	cgt	gct	gca	gaa	atg	aat	ttc	1968
Arg	Ser	Ser	Ser	Ile	Val	Lys	Val	Met	Arg	Ala	Ala	Glu	Met	Asn	Phe	
				645					650					655		
aga	tgt	cct	gtt	cga	cat	gga	gtg	ctt	gga	att	cct	ggt	tac	gtt	cag	2016
Arg	Cys	Pro	Val	Arg	His	Gly	Val	Leu	Gly	Ile	Pro	Gly	Tyr	Val	Gln	
			660					665					670			
ttc	acg	tct	ccc	att	cgt	cga	tac	atg	gat	ctt	act	gca	cac	tat	cag	2064
Phe	Thr	Ser	Pro	Ile	Arg	Arg	Tyr	Met	Asp	Leu	Thr	Ala	His	Tyr	Gln	
		675					680					685				
att	aaa	gct	ttt	ctt	cga	gga	ggt	gac	aat	ttt	cca	ttc	tct	gct	ggt	2112
Ile	Lys	Ala	Phe	Leu	Arg	Gly	Gly	Asp	Asn	Phe	Pro	Phe	Ser	Ala	Gly	
	690					695					700					

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gag tta gaa ggt ata gca gca tcc gta aac atg cag agc aaa gtg gtg 2160  
 Glu Leu Glu Gly Ile Ala Ala Ser Val Asn Met Gln Ser Lys Val Val  
 705 710 715 720  
 aga aaa ctc tca aac acc ggt ctc cgc tat tgg gta ata gag ttt ctc 2208  
 Arg Lys Leu Ser Asn Thr Gly Leu Arg Tyr Trp Val Ile Glu Phe Leu  
 725 730 735  
 aga aga cag gaa aag ggt aaa aag tac acc gca ttg gtc ttg aga ttt 2256  
 Arg Arg Gln Glu Lys Gly Lys Lys Tyr Thr Ala Leu Val Leu Arg Phe  
 740 745 750  
 gtc aaa gac cgg atc gca tcc ctt ttg ttg gtt gag gtg ggt ttt caa 2304  
 Val Lys Asp Arg Ile Ala Ser Leu Leu Leu Val Glu Val Gly Phe Gln  
 755 760 765  
 gca acg gcg tgg gtg tca gaa gga aaa caa gtg gga gat gaa atc gaa 2352  
 Ala Thr Ala Trp Val Ser Glu Gly Lys Gln Val Gly Asp Glu Ile Glu  
 770 775 780  
 gtt cga gta gaa gaa gct cat ccc cgc gac gat ctt att ctc ttc aaa 2400  
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 gag gtt atc tag 2412  
 Glu Val Ile

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&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 10

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Thr Ser Ala Gly Gly Pro Pro Val Ser Leu Phe Arg His Arg Ile Gln  
 20 25 30

Arg Leu Arg Ala Ser His Leu Arg Glu Phe Ser Lys Leu Arg Leu Asn  
 35 40 45

Phe Pro Leu Ile Arg Ala Asp Arg Arg Phe Leu Gly Asn Ser Asp Ala  
 50 55 60

Pro Ser Cys Ser Thr Cys Ile His Ser Leu Val Glu Ser Val Ser Glu  
 65 70 75 80

Glu Leu Glu Ser Ile Ser Arg Arg Lys Gly Ser Arg Met Arg Val Arg  
 85 90 95

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Ala Ser Val Lys Val Lys Leu Thr Ser Tyr Gly Glu Val Leu Glu Asp  
 100 105 110

Lys Leu Val Asn Gln Glu Leu Glu Ala Gly Leu Leu Leu Glu Phe Lys  
 115 120 125

Lys Asp Ala Asp Arg Val Leu Leu Ala Val Leu His Arg Arg Asp Gly  
 130 135 140

Lys Lys Asn Trp Met Val Phe Asp Gln Asn Gly Val Ser Cys Ser Ile  
 145 150 155 160

Lys Pro Gln Gln Ile Thr Tyr Ile Val Pro Asn Val Tyr Asn Phe Asp  
 165 170 175

His Thr Gly Leu Thr Asp Phe Leu Gln Arg Ala Gln Asp Asn Leu Asp  
 180 185 190

Pro Gln Leu Leu Glu Phe Ala Trp Met Glu Leu Leu Glu Lys Asn Lys  
 195 200 205

Pro Val Thr Pro Glu Glu Leu Ala Glu Met Ile Tyr Gly Arg Ala Asp  
 210 215 220

Pro Leu Glu Ser Tyr Cys Ala His Phe Leu Leu Ser Gln Asp Glu Ile  
 225 230 235 240

Tyr Phe Ser Ile Leu Glu Ser Lys Gly Ser Arg Ser Ile Tyr Ser Pro  
 245 250 255

Arg Pro Thr Glu Gln Val Glu Glu Leu Leu Arg Arg Gln Arg Val Lys  
 260 265 270

Glu Ala Glu Asp Lys Glu Phe Gln Glu Phe Ile Gln Leu Leu Lys Ser  
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Ala Lys Lys Ala Pro Ser His Ala Lys Pro Pro Lys Ser Ser Trp Leu  
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Ala Asp Asp Lys Val Gln Asp Arg Ile Gly Ser Leu Glu Ala Tyr Ala  
 305 310 315 320

Ile Asp Ala Trp Ala Ser Thr Asp Gln Gln Lys Leu Ala Gly Thr Ile  
 325 330 335

Leu Lys Ser Met Gly Leu Gln Lys Thr Ser Val Ser Ala Leu Asn Leu  
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340

345

350

Leu Ile Asp Ile Gly Tyr Phe Pro Val His Val Asn Leu Glu Leu Leu  
 355 360 365

Lys Leu Asn Leu Pro Thr His His Ser Glu Ala Ile Thr Glu Ala Ala  
 370 375 380

Glu Ala Leu Leu Ser Glu Ser Ser Asp Ile Asp Ala Val Arg Arg Ile  
 385 390 395 400

Asp Leu Thr His Leu Lys Val Tyr Ala Ile Asp Val Asp Glu Ala Asp  
 405 410 415

Glu Leu Asp Asp Ala Leu Ser Ala Thr Arg Leu Gln Asp Gly Arg Ile  
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Lys Ile Trp Ile His Val Ala Asp Pro Ala Arg Tyr Val Thr Pro Gly  
 435 440 445

Ser Lys Val Asp Arg Glu Ala Arg Arg Arg Gly Thr Ser Val Phe Leu  
 450 455 460

Pro Thr Ala Thr Tyr Pro Met Phe Pro Glu Lys Leu Ala Met Glu Gly  
 465 470 475 480

Met Ser Leu Arg Gln Gly Glu Asn Cys Asn Ala Val Ser Val Ser Val  
 485 490 495

Val Leu Arg Ser Asp Gly Cys Ile Thr Glu Tyr Ser Val Asp Asn Ser  
 500 505 510

Ile Ile Arg Pro Thr Tyr Met Leu Thr Tyr Glu Ser Ala Ser Glu Leu  
 515 520 525

Leu His Leu Asn Leu Glu Glu Glu Ala Glu Leu Lys Leu Leu Ser Glu  
 530 535 540

Ala Ala Phe Ile Arg Ser Gln Trp Arg Arg Glu Gln Gly Ala Val Asp  
 545 550 555 560

Thr Thr Thr Leu Glu Thr Arg Ile Lys Val Val Asn Pro Glu Asp Pro  
 565 570 575

Glu Pro Leu Ile Asn Leu Tyr Val Glu Asn Gln Ala Asp Leu Ala Met  
 580 585 590

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Arg Leu Val Phe Glu Met Met Ile Leu Cys Gly Glu Val Val Ala Thr  
 595 600 605

Phe Gly Ser Gln His Asn Ile Pro Leu Pro Tyr Arg Gly Gln Pro Gln  
 610 615 620

Ser Asn Ile Asp Val Ser Ala Phe Ala His Leu Pro Glu Gly Pro Val  
 625 630 635 640

Arg Ser Ser Ser Ile Val Lys Val Met Arg Ala Ala Glu Met Asn Phe  
 645 650 655

Arg Cys Pro Val Arg His Gly Val Leu Gly Ile Pro Gly Tyr Val Gln  
 660 665 670

Phe Thr Ser Pro Ile Arg Arg Tyr Met Asp Leu Thr Ala His Tyr Gln  
 675 680 685

Ile Lys Ala Phe Leu Arg Gly Gly Asp Asn Phe Pro Phe Ser Ala Gly  
 690 695 700

Glu Leu Glu Gly Ile Ala Ala Ser Val Asn Met Gln Ser Lys Val Val  
 705 710 715 720

Arg Lys Leu Ser Asn Thr Gly Leu Arg Tyr Trp Val Ile Glu Phe Leu  
 725 730 735

Arg Arg Gln Glu Lys Gly Lys Lys Tyr Thr Ala Leu Val Leu Arg Phe  
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Val Lys Asp Arg Ile Ala Ser Leu Leu Leu Val Glu Val Gly Phe Gln  
 755 760 765

Ala Thr Ala Trp Val Ser Glu Gly Lys Gln Val Gly Asp Glu Ile Glu  
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<211> 3888

<212> DNA

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&lt;223&gt;

&lt;400&gt; 11

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cat tcc gcc gcc gga ggt gta ata aga ggc gat gta cag gtt agg tgc His Ser Ala Ala Gly Gly Val Ile Arg Gly Asp Val Gln Val Arg Cys 20 25 30	96
gca ggc tgt cgc gtg att ctg agg gtg aaa acc ggc gtt gtg gag ttc Ala Gly Cys Arg Val Ile Leu Arg Val Lys Thr Gly Val Val Glu Phe 35 40 45	144
tcg tgt ccg act tgt caa ctt ccc caa atg ttg ccg ccg gag ctt ctt Ser Cys Pro Thr Cys Gln Leu Pro Gln Met Leu Pro Pro Glu Leu Leu 50 55 60	192
tct agg gca cgg ccg cag ttt ccg cag tct cca caa caa cca cca cag Ser Arg Ala Arg Pro Gln Phe Pro Gln Ser Pro Gln Gln Pro Pro Gln 65 70 75 80	240
cca att cag acg ctt ccg cca ccg att caa cag cag ctt aag cct ctt Pro Ile Gln Thr Leu Pro Pro Pro Ile Gln Gln Leu Lys Pro Leu 85 90 95	288
aat cta cct agg cct ccg gtt ccg gca cat gga atc gat ccg acg aag Asn Leu Pro Arg Pro Pro Val Pro Ala His Gly Ile Asp Pro Thr Lys 100 105 110	336
atg caa ttg cct tgc gct aac tgt cag gct atc ctc aat gtg cct cat Met Gln Leu Pro Cys Ala Asn Cys Gln Ala Ile Leu Asn Val Pro His 115 120 125	384
gga ctc act cgg ttc tcg tgt cct cag tgc cat gtc gag ctc gct gtt Gly Leu Thr Arg Phe Ser Cys Pro Gln Cys His Val Glu Leu Ala Val 130 135 140	432
gat gtc tcc aag ctt aat cgg tct tta act gct tct caa tct cat tct Asp Val Ser Lys Leu Asn Arg Ser Leu Thr Ala Ser Gln Ser His Ser 145 150 155 160	480
aat cct cct act cct gct gct ccc aca gtc ccg cct ccg cct cct ccc Asn Pro Pro Thr Pro Ala Ala Pro Thr Val Pro Pro Pro Pro Pro Pro 165 170 175	528
gaa gaa gtc aat gag gaa gct att gaa gtg gag aga gaa gaa gat gaa Glu Glu Val Asn Glu Glu Ala Ile Glu Val Glu Arg Glu Glu Asp Glu 180 185 190	576
ggg gga acg gct gga gaa acg ttt atg gat tat cgt ccc cca aaa ctt	624

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Gly	Gly	Thr	Ala	Gly	Glu	Thr	Phe	Met	Asp	Tyr	Arg	Pro	Pro	Lys	Leu	
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tct	atc	gga	cct	cct	cat	cct	gat	cca	att	gtg	gaa	aca	tca	tct	cta	672
Ser	Ile	Gly	Pro	Pro	His	Pro	Asp	Pro	Ile	Val	Glu	Thr	Ser	Ser	Leu	
	210					215					220					
tct	gca	gtg	caa	ccc	cca	gag	cct	act	tat	gat	ctc	aaa	atc	aag	gaa	720
Ser	Ala	Val	Gln	Pro	Pro	Glu	Pro	Thr	Tyr	Asp	Leu	Lys	Ile	Lys	Glu	
	225				230					235					240	
gag	ctt	gaa	agg	tca	aag	gct	tta	tcg	tgt	ttg	cag	att	gag	aca	tta	768
Glu	Leu	Glu	Arg	Ser	Lys	Ala	Leu	Ser	Cys	Leu	Gln	Ile	Glu	Thr	Leu	
				245					250					255		
gtt	tac	gct	tgc	cag	agg	cat	ctc	cag	cac	ctt	gct	gat	ggt	acc	aga	816
Val	Tyr	Ala	Cys	Gln	Arg	His	Leu	Gln	His	Leu	Ala	Asp	Gly	Thr	Arg	
			260					265					270			
gca	ggc	ttt	ttt	gtt	gga	gat	ggt	gct	ggt	gtg	ggc	aaa	ggg	cga	aca	864
Ala	Gly	Phe	Phe	Val	Gly	Asp	Gly	Ala	Gly	Val	Gly	Lys	Gly	Arg	Thr	
		275					280					285				
att	gcc	ggg	ttg	att	tgg	gaa	aat	tgg	aaa	cat	gga	agg	agg	aaa	gct	912
Ile	Ala	Gly	Leu	Ile	Trp	Glu	Asn	Trp	Lys	His	Gly	Arg	Arg	Lys	Ala	
	290					295					300					
ttg	tgg	att	tct	att	ggc	tca	gac	ttg	aaa	tat	gat	gca	aga	agg	gac	960
Leu	Trp	Ile	Ser	Ile	Gly	Ser	Asp	Leu	Lys	Tyr	Asp	Ala	Arg	Arg	Asp	
	305				310					315					320	
ttg	gat	gat	gtg	ggt	gct	aca	tgc	gtt	gga	gtg	aat	cct	ttg	aac	aag	1008
Leu	Asp	Asp	Val	Gly	Ala	Thr	Cys	Val	Gly	Val	Asn	Pro	Leu	Asn	Lys	
				325					330					335		
cta	ccc	tat	tct	aag	ctt	gac	tcg	aaa	aat	gtt	ggt	att	aaa	gaa	gga	1056
Leu	Pro	Tyr	Ser	Lys	Leu	Asp	Ser	Lys	Asn	Val	Gly	Ile	Lys	Glu	Gly	
			340					345					350			
gtg	gta	ttc	ttg	aca	tac	aat	agc	ctc	att	gct	tcc	tct	gag	aag	ggc	1104
Val	Val	Phe	Leu	Thr	Tyr	Asn	Ser	Leu	Ile	Ala	Ser	Ser	Glu	Lys	Gly	
		355					360					365				
cgt	tct	cgt	tta	cag	cag	ctt	gtt	caa	tgg	tgt	gga	cca	gaa	ttt	gat	1152
Arg	Ser	Arg	Leu	Gln	Gln	Leu	Val	Gln	Trp	Cys	Gly	Pro	Glu	Phe	Asp	
	370					375					380					
ggt	ctc	ttg	atc	ttt	gat	gag	tgc	cat	aaa	gcg	aaa	aat	ttg	gta	cct	1200
Gly	Leu	Leu	Ile	Phe	Asp	Glu	Cys	His	Lys	Ala	Lys	Asn	Leu	Val	Pro	
	385				390					395					400	
gaa	gct	ggg	agt	cag	ccg	aca	cgc	atc	gga	cag	gca	gtt	gtt	gac	att	1248
Glu	Ala	Gly	Ser	Gln	Pro	Thr	Arg	Ile	Gly	Gln	Ala	Val	Val	Asp	Ile	
				405					410					415		
cag	gat	aag	atc	ccc	caa	gca	cgt	gtt	att	tat	tgc	tcg	gct	act	ggg	1296
Gln	Asp	Lys	Ile	Pro	Gln	Ala	Arg	Val	Ile	Tyr	Cys	Ser	Ala	Thr	Gly	
			420					425					430			
gca	tca	gaa	cca	cga	aac	atg	ggt	tat	atg	gtc	agg	ctt	ggt	ctt	tgg	1344
Ala	Ser	Glu	Pro	Arg	Asn	Met	Gly	Tyr	Met	Val	Arg	Leu	Gly	Leu	Trp	
		435					440					445				

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gat Asp 465	aaa Lys	ggt Gly	ggg Gly	aca Thr	gga Gly 470	gcg Ala	ttg Leu	gaa Glu	ttg Leu	gtt Val 475	gcc Ala	atg Met	gat Asp	atg Met	aaa Lys 480	1440
gcg Ala	agg Arg	ggg Gly	atg Met	tat Tyr 485	gta Val	tgc Cys	cga Arg	acc Thr	ctg Leu 490	agt Ser	tac Tyr	aaa Lys	ggg Gly	gct Ala 495	gag Glu	1488
ttt Phe	gag Glu	att Ile	gtt Val 500	gaa Glu	gct Ala	cgt Arg	tta Leu	gaa Glu 505	gca Ala	gga Gly	atg Met	gag Glu	gca Ala 510	atg Met	tac Tyr	1536
aat Asn	aag Lys	tct Ser 515	gca Ala	gaa Glu	ttt Phe	tgg Trp	gca Ala 520	gag Glu	cta Leu	cgg Arg	ata Ile	gag Glu 525	ttg Leu	ttg Leu	tca Ser	1584
gca Ala 530	agt Ser	gct Ala	ttt Phe	ctc Leu	cct Pro	aac Asn 535	gag Glu	aaa Lys	cca Pro	aat Asn	tct Ser 540	agt Ser	cag Gln	ttg Leu	tgg Trp	1632
aga Arg 545	tta Leu	tac Tyr	tgg Trp	tca Ser	agc Ser 550	cac His	cag Gln	cgt Arg	ttc Phe	ttt Phe 555	aga Arg	cac His	ctg Leu	tgt Cys	atg Met 560	1680
tca Ser	gct Ala	aaa Lys	gtc Val	cct Pro 565	gta Val	act Thr	gtg Val	agg Arg	tta Leu 570	gct Ala	aag Lys	aaa Lys	gcc Ala	ttg Leu 575	tca Ser	1728
aca Thr	aac Asn	aag Lys	tgt Cys 580	gta Val	gtt Val	att Ile	ggc Gly	ctt Leu 585	cag Gln	agt Ser	act Thr	gga Gly	gag Glu 590	gct Ala	cga Arg	1776
acc Thr	gaa Glu	gag Glu 595	gct Ala	gta Val	aat Asn	aaa Lys	tat Tyr 600	ggt Gly	ctt Leu	gag Glu	ctt Leu	gat Asp 605	gat Asp	ttt Phe	gtc Val	1824
tcg Ser 610	gga Gly	cct Pro	cga Arg	gag Glu	ctc Leu	ttg Leu 615	ttg Leu	aaa Lys	ttt Phe	gtg Val	gaa Glu 620	gag Glu	aat Asn	tat Tyr	ccc Pro	1872
tta Leu 625	ccc Pro	gag Glu	cag Gln	cct Pro	gaa Glu 630	cct Pro	ctg Leu	tca Ser	gag Glu	gat Asp 635	gat Asp	agt Ser	gtt Val	aaa Lys	gaa Glu 640	1920
ctt Leu	cag Gln	agg Arg	aag Lys	agg Arg 645	cat His	tca Ser	gct Ala	tca Ser	cct Pro 650	ggt Gly	gtt Val	tca Ser	att Ile	aga Arg 655	ggg Gly	1968
aga Arg	gta Val	aga Arg	aag Lys 660	atg Met	gca Ala	aag Lys	tgg Trp	aaa Lys 665	cca Pro	gat Asp	agt Ser	gat Asp	aat Asn 670	gaa Glu	agt Ser	2016
gat Asp	ttg Leu	gag Glu 675	tct Ser	gaa Glu	gct Ala	gac Asp	tct Ser 680	gct Ala	gac Asp	gat Asp	tct Ser	aat Asn 685	gat Asp	tct Ser	gat Asp	2064
gat Asp 690	gag Glu	ttc Phe	cag Gln	ata Ile	tgt Cys	cag Gln 695	ata Ile	tgc Cys	agt Ser	ggg Gly	gaa Glu 700	gat Asp	gaa Glu	agg Arg	aag Lys	2112

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aag Lys 705	ttg Leu	ctc Leu	cat His	tgt Cys	tct Ser 710	gaa Glu	tgt Cys	gac Asp	aag Lys	ctt Leu 715	ttt Phe	cat His	ccg Pro	gac Asp	tgt Cys 720	2160
gtg Val	gtt Val	cct Pro	cca Pro	gtt Val 725	ata Ile	gac Asp	tta Leu	cca Pro	tct Ser 730	gaa Glu	gcg Ala	tgg Trp	att Ile	tgc Cys 735	ttt Phe	2208
tct Ser	tgt Cys	aag Lys	gaa Glu 740	aag Lys	aca Thr	gag Glu	gag Glu	tac Tyr 745	att Ile	caa Gln	gca Ala	aga Arg	cgt Arg 750	ctt Leu	tac Tyr	2256
att Ile	gcc Ala	gaa Glu 755	ttg Leu	cag Gln	aaa Lys	agg Arg	tat Tyr 760	gaa Glu	gca Ala	gcg Ala	ctt Leu	gaa Glu 765	cga Arg	aaa Lys	tca Ser	2304
aag Lys	atc Ile 770	ata Ile	gag Glu	atc Ile	atc Ile	cgt Arg 775	tct Ser	ctg Leu	aat Asn	ctt Leu	cca Pro 780	aac Asn	aat Asn	cct Pro	ttg Leu	2352
gat Asp 785	gac Asp	atc Ile	gtc Val	gat Asp	cag Gln 790	ctt Leu	gga Gly	ggc Gly	cct Pro	gaa Glu 795	aaa Lys	gtt Val	gca Ala	gaa Glu	atg Met 800	2400
acg Thr	ggc Gly	agg Arg	cga Arg	ggc Gly 805	atg Met	ctt Leu	gta Val	aga Arg	gca Ala 810	tcg Ser	aat Asn	ggg Gly	aaa Lys	ggc Gly 815	gtt Val	2448
aca Thr	tat Tyr	caa Gln	gca Ala 820	aga Arg	aac Asn	aca Thr	aag Lys	gat Asp 825	att Ile	acc Thr	atg Met	gaa Glu	atg Met 830	gtc Val	aac Asn	2496
atg Met	cac His	gag Glu 835	aag Lys	caa Gln	cta Leu	ttt Phe	atg Met 840	gat Asp	ggc Gly	aaa Lys	aag Lys	ttg Leu 845	gtt Val	gcc Ala	att Ile	2544
att Ile	tct Ser 850	gaa Glu	gct Ala	ggg Gly	tca Ser	gct Ala 855	ggc Gly	gtt Val	tcg Ser	ttg Leu	caa Gln 860	gca Ala	gat Asp	aga Arg	agg Arg	2592
gca Ala 865	gta Val	aat Asn	cag Gln	aaa Lys	aga Arg 870	agg Arg	gtt Val	cac His	ttg Leu 875	act Thr	tta Leu	gag Glu	ctt Leu	ccc Pro	tgg Trp 880	2640
agt Ser	gct Ala	gat Asp	cgt Arg	gca Ala 885	att Ile	cag Gln	caa Gln	ttt Phe	gga Gly 890	aga Arg	act Thr	cac His	cgg Arg	tca Ser 895	aat Asn	2688
cag Gln	aca Thr	tct Ser	gca Ala 900	cct Pro	gaa Glu	tat Tyr	aga Arg	cta Leu 905	ctc Leu	ttc Phe	act Thr	aat Asn	ctc Leu 910	ggc Gly	ggg Gly	2736
gaa Glu	cgc Arg 915	cgc Arg	ttt Phe	gcc Ala	tct Ser	att Ile	gtt Val 920	gca Ala	aag Lys	aga Arg	cta Leu	gaa Glu 925	aca Thr	ctt Leu	ggc Gly	2784
gct Ala	tta Leu 930	aca Thr	cag Gln	gga Gly	gac Asp	cgc Arg 935	agg Arg	gct Ala	ggg Gly	ccc Pro	tcc Ser 940	ggg Gly	cct Pro	tct Ser	ttg Leu	2832
agt Ser	gcg Ala	tat Tyr	aat Asn	tat Tyr	gat Asp	agt Ser	aac Asn	ttt Phe	ggc Gly	aaa Lys	aaa Lys	tcc Ser	ttg Leu	atg Met	gtg Val	2880

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945	950												960
atg tat cga ggc ata atg gag cag gag aaa cta cct gtt ctt cct cct	2928												
Met Tyr Arg Gly Ile Met Glu Gln Glu Lys Leu Pro Val Leu Pro Pro													
	965 970 975												
gga tgc tcg att gat gaa ccc gaa aca gtt aaa gag ttt ttg acc aag	2976												
Gly Cys Ser Ile Asp Glu Pro Glu Thr Val Lys Glu Phe Leu Thr Lys													
	980 985 990												
gca agg gct gct ctt gtt gcg gtt gga att gtt agg gac agt gtt ctg	3024												
Ala Arg Ala Ala Leu Val Ala Val Gly Ile Val Arg Asp Ser Val Leu													
	995 1000 1005												
gcc aat ggg aaa gat gtt gga agg ttt tca gga cgt att att gat	3069												
Ala Asn Gly Lys Asp Val Gly Arg Phe Ser Gly Arg Ile Ile Asp													
	1010 1015 1020												
tct gac atg cat gat gtt gga cga ttt ttg aat cgc ctc tta gga	3114												
Ser Asp Met His Asp Val Gly Arg Phe Leu Asn Arg Leu Leu Gly													
	1025 1030 1035												
ttg cca cct gat atc cag aat agg ctg ttt gaa ttg ttt act agt	3159												
Leu Pro Pro Asp Ile Gln Asn Arg Leu Phe Glu Leu Phe Thr Ser													
	1040 1045 1050												
ata tta gac gtt ctt gta cat aat gct cgg ata gaa gga agt ttt	3204												
Ile Leu Asp Val Leu Val His Asn Ala Arg Ile Glu Gly Ser Phe													
	1055 1060 1065												
gac tca gga att gtg gat atg aaa gct aat agt gtt gag cta ctg	3249												
Asp Ser Gly Ile Val Asp Met Lys Ala Asn Ser Val Glu Leu Leu													
	1070 1075 1080												
agc act cca aag acc gtc cat gtt gat caa atg tct ggt gcc tca	3294												
Ser Thr Pro Lys Thr Val His Val Asp Gln Met Ser Gly Ala Ser													
	1085 1090 1095												
act atg ctc ttt act ttt act cta gat cgt ggt gta aca tgg gag	3339												
Thr Met Leu Phe Thr Phe Thr Leu Asp Arg Gly Val Thr Trp Glu													
	1100 1105 1110												
tct gcg agt tca atg cta gag gga aag aga agg gac ggg ctt ggt	3384												
Ser Ala Ser Ser Met Leu Glu Gly Lys Arg Arg Asp Gly Leu Gly													
	1115 1120 1125												
tca gct aat gat ggc ttt ttt gaa tct aaa agg gaa tgg tta gga	3429												
Ser Ala Asn Asp Gly Phe Phe Glu Ser Lys Arg Glu Trp Leu Gly													
	1130 1135 1140												
aga cgg cac ttc ata tta gca ttt gag agt gcc gct tct ggg ttg	3474												
Arg Arg His Phe Ile Leu Ala Phe Glu Ser Ala Ala Ser Gly Leu													
	1145 1150 1155												
ttt aag att gta cgt cct gct gta gga gag tcg atc agg gag atg	3519												
Phe Lys Ile Val Arg Pro Ala Val Gly Glu Ser Ile Arg Glu Met													
	1160 1165 1170												
tct ctt tca gag ttg aaa act aaa tac cga aaa cta tct tct ctg	3564												
Ser Leu Ser Glu Leu Lys Thr Lys Tyr Arg Lys Leu Ser Ser Leu													
	1175 1180 1185												
gag aag gct cgt act ggt tgg gag gac gag tac gaa gtt tca tca	3609												

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Glu	Lys	Ala	Arg	Thr	Gly	Trp	Glu	Asp	Glu	Tyr	Glu	Val	Ser	Ser	
1190						1195					1200				
aaa	cag	tgt	atg	cat	gga	ccc	aag	tgt	aag	ctt	ggg	gag	tat	tgc	3654
Lys	Gln	Cys	Met	His	Gly	Pro	Lys	Cys	Lys	Leu	Gly	Glu	Tyr	Cys	
1205						1210					1215				
acg	gtt	gga	cgt	agg	ata	cag	gaa	gta	aac	gtt	gtg	ggt	ggc	ctt	3699
Thr	Val	Gly	Arg	Arg	Ile	Gln	Glu	Val	Asn	Val	Val	Gly	Gly	Leu	
1220						1225					1230				
att	ctt	ccc	atc	tgg	gga	acc	atc	gag	aaa	gct	ctc	tcc	aaa	caa	3744
Ile	Leu	Pro	Ile	Trp	Gly	Thr	Ile	Glu	Lys	Ala	Leu	Ser	Lys	Gln	
1235						1240					1245				
gcc	cgt	cac	agc	cac	aag	aga	att	cga	gtt	ata	cgc	ata	gag	act	3789
Ala	Arg	His	Ser	His	Lys	Arg	Ile	Arg	Val	Ile	Arg	Ile	Glu	Thr	
1250						1255					1260				
acg	acg	gat	aat	cag	cgg	ata	gtg	ggc	ctc	tcc	atc	cca	aat	gca	3834
Thr	Thr	Asp	Asn	Gln	Arg	Ile	Val	Gly	Leu	Ser	Ile	Pro	Asn	Ala	
1265						1270					1275				
gct	gta	gaa	act	gtt	tta	caa	gat	tta	gca	tgg	gtt	caa	gag	att	3879
Ala	Val	Glu	Thr	Val	Leu	Gln	Asp	Leu	Ala	Trp	Val	Gln	Glu	Ile	
1280						1285					1290				
gat	gat	taa													3888
Asp	Asp														
1295															

&lt;210&gt; 12

&lt;211&gt; 1295

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 12

Met	Thr	Gln	Ser	Pro	Val	Gln	Pro	Pro	Pro	Pro	Leu	Pro	Ala	Gln	Pro
1				5					10					15	
His	Ser	Ala	Ala	Gly	Gly	Val	Ile	Arg	Gly	Asp	Val	Gln	Val	Arg	Cys
			20					25					30		
Ala	Gly	Cys	Arg	Val	Ile	Leu	Arg	Val	Lys	Thr	Gly	Val	Val	Glu	Phe
		35					40					45			
Ser	Cys	Pro	Thr	Cys	Gln	Leu	Pro	Gln	Met	Leu	Pro	Pro	Glu	Leu	Leu
	50					55					60				
Ser	Arg	Ala	Arg	Pro	Gln	Phe	Pro	Gln	Ser	Pro	Gln	Gln	Pro	Pro	Gln
65					70				75						80

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Pro Ile Gln Thr Leu Pro Pro Pro Ile Gln Gln Gln Leu Lys Pro Leu  
85 90 95

Asn Leu Pro Arg Pro Pro Val Pro Ala His Gly Ile Asp Pro Thr Lys  
100 105 110

Met Gln Leu Pro Cys Ala Asn Cys Gln Ala Ile Leu Asn Val Pro His  
115 120 125

Gly Leu Thr Arg Phe Ser Cys Pro Gln Cys His Val Glu Leu Ala Val  
130 135 140

Asp Val Ser Lys Leu Asn Arg Ser Leu Thr Ala Ser Gln Ser His Ser  
145 150 155 160

Asn Pro Pro Thr Pro Ala Ala Pro Thr Val Pro Pro Pro Pro Pro Pro  
165 170 175

Glu Glu Val Asn Glu Glu Ala Ile Glu Val Glu Arg Glu Glu Asp Glu  
180 185 190

Gly Gly Thr Ala Gly Glu Thr Phe Met Asp Tyr Arg Pro Pro Lys Leu  
195 200 205

Ser Ile Gly Pro Pro His Pro Asp Pro Ile Val Glu Thr Ser Ser Leu  
210 215 220

Ser Ala Val Gln Pro Pro Glu Pro Thr Tyr Asp Leu Lys Ile Lys Glu  
225 230 235 240

Glu Leu Glu Arg Ser Lys Ala Leu Ser Cys Leu Gln Ile Glu Thr Leu  
245 250 255

Val Tyr Ala Cys Gln Arg His Leu Gln His Leu Ala Asp Gly Thr Arg  
260 265 270

Ala Gly Phe Phe Val Gly Asp Gly Ala Gly Val Gly Lys Gly Arg Thr  
275 280 285

Ile Ala Gly Leu Ile Trp Glu Asn Trp Lys His Gly Arg Arg Lys Ala  
290 295 300

Leu Trp Ile Ser Ile Gly Ser Asp Leu Lys Tyr Asp Ala Arg Arg Asp  
305 310 315 320

Leu Asp Asp Val Gly Ala Thr Cys Val Gly Val Asn Pro Leu Asn Lys  
325 330 335

Leu Pro Tyr Ser Lys Leu Asp Ser Lys Asn Val Gly Ile Lys Glu Gly  
 340 345 350

Val Val Phe Leu Thr Tyr Asn Ser Leu Ile Ala Ser Ser Glu Lys Gly  
 355 360 365

Arg Ser Arg Leu Gln Gln Leu Val Gln Trp Cys Gly Pro Glu Phe Asp  
 370 375 380

Gly Leu Leu Ile Phe Asp Glu Cys His Lys Ala Lys Asn Leu Val Pro  
 385 390 395 400

Glu Ala Gly Ser Gln Pro Thr Arg Ile Gly Gln Ala Val Val Asp Ile  
 405 410 415

Gln Asp Lys Ile Pro Gln Ala Arg Val Ile Tyr Cys Ser Ala Thr Gly  
 420 425 430

Ala Ser Glu Pro Arg Asn Met Gly Tyr Met Val Arg Leu Gly Leu Trp  
 435 440 445

Gly Ala Gly Thr Ser Phe Ser Asp Phe Asn Lys Phe Leu Gly Ala Leu  
 450 455 460

Asp Lys Gly Gly Thr Gly Ala Leu Glu Leu Val Ala Met Asp Met Lys  
 465 470 475 480

Ala Arg Gly Met Tyr Val Cys Arg Thr Leu Ser Tyr Lys Gly Ala Glu  
 485 490 495

Phe Glu Ile Val Glu Ala Arg Leu Glu Ala Gly Met Glu Ala Met Tyr  
 500 505 510

Asn Lys Ser Ala Glu Phe Trp Ala Glu Leu Arg Ile Glu Leu Leu Ser  
 515 520 525

Ala Ser Ala Phe Leu Pro Asn Glu Lys Pro Asn Ser Ser Gln Leu Trp  
 530 535 540

Arg Leu Tyr Trp Ser Ser His Gln Arg Phe Phe Arg His Leu Cys Met  
 545 550 555 560

Ser Ala Lys Val Pro Val Thr Val Arg Leu Ala Lys Lys Ala Leu Ser  
 565 570 575

Thr Asn Lys Cys Val Val Ile Gly Leu Gln Ser Thr Gly Glu Ala Arg  
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580

585

590

Thr Glu Glu Ala Val Asn Lys Tyr Gly Leu Glu Leu Asp Asp Phe Val  
595 600 605

Ser Gly Pro Arg Glu Leu Leu Leu Lys Phe Val Glu Glu Asn Tyr Pro  
610 615 620

Leu Pro Glu Gln Pro Glu Pro Leu Ser Glu Asp Asp Ser Val Lys Glu  
625 630 635 640

Leu Gln Arg Lys Arg His Ser Ala Ser Pro Gly Val Ser Ile Arg Gly  
645 650 655

Arg Val Arg Lys Met Ala Lys Trp Lys Pro Asp Ser Asp Asn Glu Ser  
660 665 670

Asp Leu Glu Ser Glu Ala Asp Ser Ala Asp Asp Ser Asn Asp Ser Asp  
675 680 685

Asp Glu Phe Gln Ile Cys Gln Ile Cys Ser Gly Glu Asp Glu Arg Lys  
690 695 700

Lys Leu Leu His Cys Ser Glu Cys Asp Lys Leu Phe His Pro Asp Cys  
705 710 715 720

Val Val Pro Pro Val Ile Asp Leu Pro Ser Glu Ala Trp Ile Cys Phe  
725 730 735

Ser Cys Lys Glu Lys Thr Glu Glu Tyr Ile Gln Ala Arg Arg Leu Tyr  
740 745 750

Ile Ala Glu Leu Gln Lys Arg Tyr Glu Ala Ala Leu Glu Arg Lys Ser  
755 760 765

Lys Ile Ile Glu Ile Ile Arg Ser Leu Asn Leu Pro Asn Asn Pro Leu  
770 775 780

Asp Asp Ile Val Asp Gln Leu Gly Gly Pro Glu Lys Val Ala Glu Met  
785 790 795 800

Thr Gly Arg Arg Gly Met Leu Val Arg Ala Ser Asn Gly Lys Gly Val  
805 810 815

Thr Tyr Gln Ala Arg Asn Thr Lys Asp Ile Thr Met Glu Met Val Asn  
820 825 830

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Met His Glu Lys Gln Leu Phe Met Asp Gly Lys Lys Leu Val Ala Ile  
 835 840 845

Ile Ser Glu Ala Gly Ser Ala Gly Val Ser Leu Gln Ala Asp Arg Arg  
 850 855 860

Ala Val Asn Gln Lys Arg Arg Val His Leu Thr Leu Glu Leu Pro Trp  
 865 870 875 880

Ser Ala Asp Arg Ala Ile Gln Gln Phe Gly Arg Thr His Arg Ser Asn  
 885 890 895

Gln Thr Ser Ala Pro Glu Tyr Arg Leu Leu Phe Thr Asn Leu Gly Gly  
 900 905 910

Glu Arg Arg Phe Ala Ser Ile Val Ala Lys Arg Leu Glu Thr Leu Gly  
 915 920 925

Ala Leu Thr Gln Gly Asp Arg Arg Ala Gly Pro Ser Gly Pro Ser Leu  
 930 935 940

Ser Ala Tyr Asn Tyr Asp Ser Asn Phe Gly Lys Lys Ser Leu Met Val  
 945 950 955 960

Met Tyr Arg Gly Ile Met Glu Gln Glu Lys Leu Pro Val Leu Pro Pro  
 965 970 975

Gly Cys Ser Ile Asp Glu Pro Glu Thr Val Lys Glu Phe Leu Thr Lys  
 980 985 990

Ala Arg Ala Ala Leu Val Ala Val Gly Ile Val Arg Asp Ser Val Leu  
 995 1000 1005

Ala Asn Gly Lys Asp Val Gly Arg Phe Ser Gly Arg Ile Ile Asp  
 1010 1015 1020

Ser Asp Met His Asp Val Gly Arg Phe Leu Asn Arg Leu Leu Gly  
 1025 1030 1035

Leu Pro Pro Asp Ile Gln Asn Arg Leu Phe Glu Leu Phe Thr Ser  
 1040 1045 1050

Ile Leu Asp Val Leu Val His Asn Ala Arg Ile Glu Gly Ser Phe  
 1055 1060 1065

Asp Ser Gly Ile Val Asp Met Lys Ala Asn Ser Val Glu Leu Leu  
 1070 1075 1080

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Ser Thr Pro Lys Thr Val His Val Asp Gln Met Ser Gly Ala Ser  
 1085 1090 1095  
 Thr Met Leu Phe Thr Phe Thr Leu Asp Arg Gly Val Thr Trp Glu  
 1100 1105 1110  
 Ser Ala Ser Ser Met Leu Glu Gly Lys Arg Arg Asp Gly Leu Gly  
 1115 1120 1125  
 Ser Ala Asn Asp Gly Phe Phe Glu Ser Lys Arg Glu Trp Leu Gly  
 1130 1135 1140  
 Arg Arg His Phe Ile Leu Ala Phe Glu Ser Ala Ala Ser Gly Leu  
 1145 1150 1155  
 Phe Lys Ile Val Arg Pro Ala Val Gly Glu Ser Ile Arg Glu Met  
 1160 1165 1170  
 Ser Leu Ser Glu Leu Lys Thr Lys Tyr Arg Lys Leu Ser Ser Leu  
 1175 1180 1185  
 Glu Lys Ala Arg Thr Gly Trp Glu Asp Glu Tyr Glu Val Ser Ser  
 1190 1195 1200  
 Lys Gln Cys Met His Gly Pro Lys Cys Lys Leu Gly Glu Tyr Cys  
 1205 1210 1215  
 Thr Val Gly Arg Arg Ile Gln Glu Val Asn Val Val Gly Gly Leu  
 1220 1225 1230  
 Ile Leu Pro Ile Trp Gly Thr Ile Glu Lys Ala Leu Ser Lys Gln  
 1235 1240 1245  
 Ala Arg His Ser His Lys Arg Ile Arg Val Ile Arg Ile Glu Thr  
 1250 1255 1260  
 Thr Thr Asp Asn Gln Arg Ile Val Gly Leu Ser Ile Pro Asn Ala  
 1265 1270 1275  
 Ala Val Glu Thr Val Leu Gln Asp Leu Ala Trp Val Gln Glu Ile  
 1280 1285 1290  
 Asp Asp  
 1295

&lt;210&gt; 13

&lt;211&gt; 1038

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis thaliana

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(1038)

&lt;223&gt;

&lt;400&gt; 13

atg	gtg	ttg	gta	acc	cat	aaa	ttg	cag	ggg	tca	cat	gtc	ttg	tct	cct	48
Met	Val	Leu	Val	Thr	His	Lys	Leu	Gln	Gly	Ser	His	Val	Leu	Ser	Pro	
1				5					10				15			
tgg	agt	tcg	cca	aca	tgg	acc	aga	ggc	ttg	tgt	tta	aag	aga	cct	gtt	96
Trp	Ser	Ser	Pro	Thr	Trp	Thr	Arg	Gly	Leu	Cys	Leu	Lys	Arg	Pro	Val	
			20					25					30			
acg	aca	gtg	cac	ttt	gtt	gag	agg	aaa	gat	aag	cat	tta	cga	ttg	aag	144
Thr	Thr	Val	His	Phe	Val	Glu	Arg	Lys	Asp	Lys	His	Leu	Arg	Leu	Lys	
		35				40					45					
caa	aaa	tgt	tgt	ttt	agt	tta	ggg	tcc	cct	tgc	aac	ggg	gga	ttg	aga	192
Gln	Lys	Cys	Cys	Phe	Ser	Leu	Gly	Ser	Pro	Cys	Asn	Gly	Gly	Leu	Arg	
	50					55					60					
gca	aaa	cct	ttc	aga	gtt	aca	tct	ttt	aaa	ggg	ggc	atc	caa	aat	aat	240
Ala	Lys	Pro	Phe	Arg	Val	Thr	Ser	Phe	Lys	Gly	Gly	Ile	Gln	Asn	Asn	
65					70					75					80	
gaa	tca	gga	gga	agt	gag	ggg	ggg	aag	aaa	gtt	act	aat	aac	tct	gtc	288
Glu	Ser	Gly	Gly	Ser	Glu	Gly	Gly	Lys	Lys	Val	Thr	Asn	Asn	Ser	Val	
				85					90					95		
aaa	cta	tct	tac	cgt	tca	gat	gat	gac	gaa	aat	aat	gtg	aat	ggc	tcc	336
Lys	Leu	Ser	Tyr	Arg	Ser	Asp	Asp	Asp	Glu	Asn	Asn	Val	Asn	Gly	Ser	
			100					105					110			
cca	aag	gca	cag	aac	act	tcg	ttt	tca	tat	acc	tcg	gaa	aca	gag	gat	384
Pro	Lys	Ala	Gln	Asn	Thr	Ser	Phe	Ser	Tyr	Thr	Ser	Glu	Thr	Glu	Asp	
		115					120					125				
tcc	atg	aca	ggg	caa	ccc	gct	att	cag	aaa	cta	ttc	aag	aaa	tgg	ttg	432
Ser	Met	Thr	Gly	Gln	Pro	Ala	Ile	Gln	Lys	Leu	Phe	Lys	Lys	Trp	Leu	
	130					135					140					
aca	ttg	ttg	cgc	aca	cag	tca	cct	att	caa	gtg	att	gac	gag	act	tta	480
Thr	Leu	Leu	Arg	Thr	Gln	Ser	Pro	Ile	Gln	Val	Ile	Asp	Glu	Thr	Leu	
145					150					155					160	
gga	gga	gaa	cag	gtt	cca	caa	acg	acg	aag	caa	gaa	act	gaa	aca	gaa	528
Gly	Gly	Glu	Gln	Val	Pro	Gln	Thr	Thr	Lys	Gln	Glu	Thr	Glu	Thr	Glu	
				165					170					175		

## 70166USNP.ST25

att cgg aaa gca gaa agt ctc cag agt acc aaa aat aca gtt tgg tcc 576  
 Ile Arg Lys Ala Glu Ser Leu Gln Ser Thr Lys Asn Thr Val Trp Ser  
 180 185 190

tgg ttt tgg agt cta gac gca gct atc aag att ccg ttg ctg tta ttt 624  
 Trp Phe Trp Ser Leu Asp Ala Ala Ile Lys Ile Pro Leu Leu Leu Phe  
 195 200 205

gtt cca gct ttc cta gct gtt tac gcg atc tgt ggt gct gaa gtt aca 672  
 Val Pro Ala Phe Leu Ala Val Tyr Ala Ile Cys Gly Ala Glu Val Thr  
 210 215 220

aag gaa tta tcc cct atg tgg gtg gtt ggc ccc ttg atc atc gcc ctt 720  
 Lys Glu Leu Ser Pro Met Trp Val Val Gly Pro Leu Ile Ile Ala Leu  
 225 230 235 240

tat ata aaa atg ttc caa gga cta tgt tcc ctt tac gcc ttc tgc ttc 768  
 Tyr Ile Lys Met Phe Gln Gly Leu Cys Ser Leu Tyr Ala Phe Cys Phe  
 245 250 255

aac caa acc atc aaa atg ata aga aac cta cca tcg tat tat ctt gta 816  
 Asn Gln Thr Ile Lys Met Ile Arg Asn Leu Pro Ser Tyr Tyr Leu Val  
 260 265 270

gca tac caa tac att gcc gat gga aag ctc aaa gac gac gtt aaa gct 864  
 Ala Tyr Gln Tyr Ile Ala Asp Gly Lys Leu Lys Asp Asp Val Lys Ala  
 275 280 285

cta gtg ttt aaa cca gtg gtg gcc atc aag aac aca gac tac aaa gag 912  
 Leu Val Phe Lys Pro Val Val Ala Ile Lys Asn Thr Asp Tyr Lys Glu  
 290 295 300

ctc aca cgc acg aag ctg aaa cag ttc caa gaa tgg atc att gag aaa 960  
 Leu Thr Arg Thr Lys Leu Lys Gln Phe Gln Glu Trp Ile Ile Glu Lys  
 305 310 315 320

tac ctg gat ttt gtt gaa tct gta tgg cct tat tac tgc aga act atc 1008  
 Tyr Leu Asp Phe Val Glu Ser Val Trp Pro Tyr Tyr Cys Arg Thr Ile  
 325 330 335

aga ttc ctg aag agg gct aac ctg att tga 1038  
 Arg Phe Leu Lys Arg Ala Asn Leu Ile  
 340 345

&lt;210&gt; 14

&lt;211&gt; 345

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 14

Met Val Leu Val Thr His Lys Leu Gln Gly Ser His Val Leu Ser Pro  
 1 5 10 15

Trp Ser Ser Pro Thr Trp Thr Arg Gly Leu Cys Leu Lys Arg Pro Val  
 20 25 30

Thr Thr Val His Phe Val Glu Arg Lys Asp Lys His Leu Arg Leu Lys  
 35 40 45

Gln Lys Cys Cys Phe Ser Leu Gly Ser Pro Cys Asn Gly Gly Leu Arg  
 50 55 60

Ala Lys Pro Phe Arg Val Thr Ser Phe Lys Gly Gly Ile Gln Asn Asn  
 65 70 75 80

Glu Ser Gly Gly Ser Glu Gly Gly Lys Lys Val Thr Asn Asn Ser Val  
 85 90 95

Lys Leu Ser Tyr Arg Ser Asp Asp Asp Glu Asn Asn Val Asn Gly Ser  
 100 105 110

Pro Lys Ala Gln Asn Thr Ser Phe Ser Tyr Thr Ser Glu Thr Glu Asp  
 115 120 125

Ser Met Thr Gly Gln Pro Ala Ile Gln Lys Leu Phe Lys Lys Trp Leu  
 130 135 140

Thr Leu Leu Arg Thr Gln Ser Pro Ile Gln Val Ile Asp Glu Thr Leu  
 145 150 155 160

Gly Gly Glu Gln Val Pro Gln Thr Thr Lys Gln Glu Thr Glu Thr Glu  
 165 170 175

Ile Arg Lys Ala Glu Ser Leu Gln Ser Thr Lys Asn Thr Val Trp Ser  
 180 185 190

Trp Phe Trp Ser Leu Asp Ala Ala Ile Lys Ile Pro Leu Leu Leu Phe  
 195 200 205

Val Pro Ala Phe Leu Ala Val Tyr Ala Ile Cys Gly Ala Glu Val Thr  
 210 215 220

Lys Glu Leu Ser Pro Met Trp Val Val Gly Pro Leu Ile Ile Ala Leu  
 225 230 235 240

Tyr Ile Lys Met Phe Gln Gly Leu Cys Ser Leu Tyr Ala Phe Cys Phe  
 245 250 255

Asn Gln Thr Ile Lys Met Ile Arg Asn Leu Pro Ser Tyr Tyr Leu Val  
 260 265 270

Ala Tyr Gln Tyr Ile Ala Asp Gly Lys Leu Lys Asp Asp Val Lys Ala  
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275

280

285

Leu Val Phe Lys Pro Val Val Ala Ile Lys Asn Thr Asp Tyr Lys Glu  
 290 295 300

Leu Thr Arg Thr Lys Leu Lys Gln Phe Gln Glu Trp Ile Ile Glu Lys  
 305 310 315 320

Tyr Leu Asp Phe Val Glu Ser Val Trp Pro Tyr Tyr Cys Arg Thr Ile  
 325 330 335

Arg Phe Leu Lys Arg Ala Asn Leu Ile  
 340 345

&lt;210&gt; 15

&lt;211&gt; 6474

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis thaliana

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(6474)

&lt;223&gt;

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1659)..(1659)

&lt;223&gt; Xaa= any amino acid

&lt;400&gt; 15

atg gaa ggg gat gag cga gga gtc tta ctt gct tgt gta att tcg ggt 48  
 Met Glu Gly Asp Glu Arg Gly Val Leu Leu Ala Cys Val Ile Ser Gly  
 1 5 10 15

acc ctt ttc acg gtt ttc ggt tcg ggt tcg ttt tgg ata ctt tgg gct 96  
 Thr Leu Phe Thr Val Phe Gly Ser Gly Ser Phe Trp Ile Leu Trp Ala  
 20 25 30

gtt aat tgg cgg cca tgg cgt ctc tac agt tgg atc ttt gct aga aaa 144  
 Val Asn Trp Arg Pro Trp Arg Leu Tyr Ser Trp Ile Phe Ala Arg Lys  
 35 40 45

tgg cca aaa gta ttg caa ggt cct cag ctt gat ata cta tgt ggt gtt 192  
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Trp	Pro	Lys	Val	Leu	Gln	Gly	Pro	Gln	Leu	Asp	Ile	Leu	Cys	Gly	Val	
50						55					60					
cta	tct	ctt	ttt	gct	tgg	att	gtg	gta	gta	tcc	cct	att	gca	atc	ttg	240
Leu	Ser	Leu	Phe	Ala	Trp	Ile	Val	Val	Val	Ser	Pro	Ile	Ala	Ile	Leu	
65					70					75					80	
ata	gga	tgg	ggt	tct	tgg	ctg	att	gtg	ata	ttg	gat	cga	cat	atc	att	288
Ile	Gly	Trp	Gly	Ser	Trp	Leu	Ile	Val	Ile	Leu	Asp	Arg	His	Ile	Ile	
				85					90					95		
ggg	ctg	gcg	ata	ata	atg	gct	gga	rca	gcc	ctt	tta	ctg	gca	ttc	tac	336
Gly	Leu	Ala	Ile	Ile	Met	Ala	Gly	Xaa	Ala	Leu	Leu	Leu	Ala	Phe	Tyr	
			100					105					110			
tca	atc	atg	ctt	tgg	tgg	agg	acc	cag	tgg	caa	agc	tca	aga	gct	gtc	384
Ser	Ile	Met	Leu	Trp	Trp	Arg	Thr	Gln	Trp	Gln	Ser	Ser	Arg	Ala	Val	
		115					120					125				
gct	tta	ctt	ctc	ctt	ctt	ggt	gtt	gcc	tta	cta	tgt	gcg	tat	gaa	ctc	432
Ala	Leu	Leu	Leu	Leu	Leu	Gly	Val	Ala	Leu	Leu	Cys	Ala	Tyr	Glu	Leu	
	130					135					140					
tgt	gct	gtc	tat	gtt	acg	gct	ggt	gcg	cat	gca	tct	cag	caa	tat	tct	480
Cys	Ala	Val	Tyr	Val	Thr	Ala	Gly	Ala	His	Ala	Ser	Gln	Gln	Tyr	Ser	
145					150					155					160	
cct	tct	ggt	ttc	ttt	ttc	ggt	gta	tca	gca	atc	gcg	ttg	gca	att	aac	528
Pro	Ser	Gly	Phe	Phe	Phe	Gly	Val	Ser	Ala	Ile	Ala	Leu	Ala	Ile	Asn	
				165					170					175		
atg	cta	ttt	atc	tgc	cgc	atg	gtc	ttt	aat	gga	aat	ggt	tta	gat	gtg	576
Met	Leu	Phe	Ile	Cys	Arg	Met	Val	Phe	Asn	Gly	Asn	Gly	Leu	Asp	Val	
			180					185					190			
gac	gaa	tat	gta	agg	agg	gca	tat	aaa	ttt	gct	tat	tca	gat	tgt	ata	624
Asp	Glu	Tyr	Val	Arg	Arg	Ala	Tyr	Lys	Phe	Ala	Tyr	Ser	Asp	Cys	Ile	
		195					200					205				
gaa	gtg	ggt	cct	gtg	gct	tgt	ttg	cct	gaa	cct	cct	gat	cct	aat	gaa	672
Glu	Val	Gly	Pro	Val	Ala	Cys	Leu	Pro	Glu	Pro	Pro	Asp	Pro	Asn	Glu	
	210					215					220					
tta	tat	ccc	cgg	caa	acc	agc	agg	gct	tca	cat	ctt	ggc	ctt	ctg	tac	720
Leu	Tyr	Pro	Arg	Gln	Thr	Ser	Arg	Ala	Ser	His	Leu	Gly	Leu	Leu	Tyr	
225					230					235					240	
ctg	ggc	tca	ctc	gta	gtt	ctc	ctt	gcc	tac	tca	gtc	cta	tat	ggt	ctc	768
Leu	Gly	Ser	Leu	Val	Val	Leu	Leu	Ala	Tyr	Ser	Val	Leu	Tyr	Gly	Leu	
				245					250					255		
aca	gct	agg	gaa	tca	cgt	tgg	ctt	gga	gga	atc	aca	tca	gct	gca	gtt	816
Thr	Ala	Arg	Glu	Ser	Arg	Trp	Leu	Gly	Gly	Ile	Thr	Ser	Ala	Ala	Val	
			260					265					270			
att	gtt	ctt	gac	tgg	aat	att	ggg	gca	tgc	ttg	tat	ggg	ttt	aag	ctt	864
Ile	Val	Leu	Asp	Trp	Asn	Ile	Gly	Ala	Cys	Leu	Tyr	Gly	Phe	Lys	Leu	
		275					280					285				
ctt	cag	aat	cgt	gtt	ctg	gca	ctt	ttt	gtt	gct	ggc	ata	tcc	cgt	ctt	912
Leu	Gln	Asn	Arg	Val	Leu	Ala	Leu	Phe	Val	Ala	Gly	Ile	Ser	Arg	Leu	
	290					295					300					



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ttc	cta	ata	tgt	ttt	ggc	ata	cac	tac	tgg	tac	cta	ggg	cat	tgt	att	960
Phe	Leu	Ile	Cys	Phe	Gly	Ile	His	Tyr	Trp	Tyr	Leu	Gly	His	Cys	Ile	
305					310					315					320	
agt	tac	att	ttc	gta	gca	tca	gtt	cta	tca	ggg	gct	gct	ggt	tct	cgg	1008
Ser	Tyr	Ile	Phe	Val	Ala	Ser	Val	Leu	Ser	Gly	Ala	Ala	Val	Ser	Arg	
				325					330					335		
cat	cta	tct	ata	aca	gac	cca	tca	gct	gca	aga	aga	gat	gcc	tta	cag	1056
His	Leu	Ser	Ile	Thr	Asp	Pro	Ser	Ala	Ala	Arg	Arg	Asp	Ala	Leu	Gln	
			340					345					350			
agc	aca	gtg	atc	cgc	ttg	aga	gaa	ggg	ttt	cgg	aga	aaa	gag	cag	aat	1104
Ser	Thr	Val	Ile	Arg	Leu	Arg	Glu	Gly	Phe	Arg	Arg	Lys	Glu	Gln	Asn	
		355					360					365				
agt	tct	tca	agt	tct	tca	gat	ggg	tgt	ggc	tca	agt	ata	aaa	aga	agt	1152
Ser	Ser	Ser	Ser	Ser	Ser	Asp	Gly	Cys	Gly	Ser	Ser	Ile	Lys	Arg	Ser	
	370					375					380					
agt	agt	atc	gat	gct	ggc	cat	act	ggg	tgt	act	aat	gaa	gca	aat	cgt	1200
Ser	Ser	Ile	Asp	Ala	Gly	His	Thr	Gly	Cys	Thr	Asn	Glu	Ala	Asn	Arg	
385					390					395					400	
acg	gca	gaa	tct	tgc	acg	gct	gac	aat	cta	act	cga	aca	ggc	agc	tct	1248
Thr	Ala	Glu	Ser	Cys	Thr	Ala	Asp	Asn	Leu	Thr	Arg	Thr	Gly	Ser	Ser	
				405					410					415		
cag	gag	gga	atc	aat	agc	gac	aaa	agc	gaa	gaa	agt	gga	aga	cca	agc	1296
Gln	Glu	Gly	Ile	Asn	Ser	Asp	Lys	Ser	Glu	Glu	Ser	Gly	Arg	Pro	Ser	
			420					425					430			
tta	ggg	tta	cgt	agt	agt	tca	tgt	cgt	tct	gtg	gtc	caa	gag	ccc	gaa	1344
Leu	Gly	Leu	Arg	Ser	Ser	Ser	Cys	Arg	Ser	Val	Val	Gln	Glu	Pro	Glu	
		435					440					445				
gca	gga	acg	tct	tat	ttt	atg	gac	aaa	gtt	tct	gat	caa	aat	aac	act	1392
Ala	Gly	Thr	Ser	Tyr	Phe	Met	Asp	Lys	Val	Ser	Asp	Gln	Asn	Asn	Thr	
	450					455					460					
ctt	gtt	gtt	tgt	tcg	agc	agt	ggg	cta	gat	agc	caa	ggg	tac	gag	tct	1440
Leu	Val	Val	Cys	Ser	Ser	Ser	Gly	Leu	Asp	Ser	Gln	Gly	Tyr	Glu	Ser	
465					470					475					480	
agc	aca	tcg	aat	tct	gca	aac	cag	cag	ctt	ttg	gat	atg	aat	ttg	gct	1488
Ser	Thr	Ser	Asn	Ser	Ala	Asn	Gln	Gln	Leu	Leu	Asp	Met	Asn	Leu	Ala	
				485					490					495		
ctt	gct	ttc	cag	gac	cag	tta	aac	aat	cct	agg	ata	gcc	tcg	ata	ctt	1536
Leu	Ala	Phe	Gln	Asp	Gln	Leu	Asn	Asn	Pro	Arg	Ile	Ala	Ser	Ile	Leu	
			500					505					510			
aag	aag	aaa	sma	aaa	gaa	ggg	gat	ctt	gaa	ctg	act	aat	ttg	ctg	caa	1584
Lys	Lys	Lys	Xaa	Lys	Glu	Gly	Asp	Leu	Glu	Leu	Thr	Asn	Leu	Leu	Gln	
		515					520					525				
gac	aag	ggg	ttg	gac	cct	aac	ttt	gct	gta	atg	ttg	aag	gaa	aaa	aac	1632
Asp	Lys	Gly	Leu	Asp	Pro	Asn	Phe	Ala	Val	Met	Leu	Lys	Glu	Lys	Asn	
	530					535					540					
ttg	gat	cct	gga	aaa	aac	ttg	ggg	ctn	act	ata	ttg	gca	cta	ctt	cag	1680
Leu	Asp	Pro	Gly	Lys	Asn	Leu	Gly	Xaa	Thr	Ile	Leu	Ala	Leu	Leu	Gln	
545					550					555					560	

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agg Arg	agt Ser	agt Ser	ttg Leu	gat Asp 565	gca Ala	gat Asp	aga Arg	gat Asp	cac His 570	cgc Arg	gac Asp	aat Asn	act Thr	gat Asp 575	att Ile	1728
aca Thr	atc Ile	att Ile	gac Asp 580	tca Ser	aac Asn	agt Ser	gtt Val	gac Asp 585	aat Asn	act Thr	ttg Leu	cca Pro	aat Asn 590	cag Gln	att Ile	1776
tct Ser	tta Leu	tcc Ser 595	gaa Glu	gaa Glu	ttg Leu	aga Arg	ctc Leu 600	cgt Arg	gga Gly	cta Leu	gag Glu	aag Lys 605	tgg Trp	ctt Leu	aag Lys	1824
ttg Leu	tct Ser 610	aga Arg	ctt Leu	ctt Leu	ctg Leu	cac His 615	cat His	gta Val	gcg Ala	ggg Gly	aca Thr 620	cca Pro	gag Glu	aga Arg	gca Ala	1872
tgg Trp 625	ggc Gly	ctc Leu	ttt Phe	agt Ser	ctt Leu 630	gtc Val	ttt Phe	atc Ile	ctt Leu	gaa Glu 635	aca Thr	atc Ile	att Ile	gtg Val	gcc Ala 640	1920
att Ile	ttt Phe	cgc Arg	cca Pro	aag Lys 645	acc Thr	atc Ile	acg Thr	att Ile	ata Ile 650	aat Asn	tct Ser	agt Ser	cat His	caa Gln 655	cag Gln	1968
ttc Phe	gaa Glu	ttt Phe	ggt Gly 660	ttc Phe	tct Ser	gtg Val	ctg Leu	cta Leu 665	ttg Leu	tca Ser	cct Pro	gtt Val	gtc Val 670	tgt Cys	tca Ser	2016
ata Ile	atg Met	gct Ala 675	ttt Phe	ctt Leu	cgg Arg	tct Ser	ctt Leu 680	caa Gln	gtt Val	gag Glu	gaa Glu	atg Met 685	gcc Ala	ttg Leu	aca Thr	2064
tca Ser	aaa Lys 690	tct Ser	cgc Arg	aag Lys	tat Tyr	ggc Gly 695	ttt Phe	gtt Val	gcc Ala	tgg Trp	ctt Leu 700	ctg Leu	agc Ser	aca Thr	tca Ser	2112
gtt Val 705	gga Gly	ttg Leu	tca Ser	ctc Leu	tcg Ser 710	ttc Phe	ttg Leu	agt Ser	aaa Lys	tcg Ser 715	tca Ser	gta Val	ctt Leu	ctg Leu	gga Gly 720	2160
ata Ile	tcc Ser	ttg Leu	act Thr	gtg Val 725	ccc Pro	ctc Leu	atg Met	gca Ala	gca Ala 730	tgc Cys	ctg Leu	tct Ser	att Ile	gct Ala 735	gtt Val	2208
ccc Pro	ata Ile	tgg Trp	atg Met 740	cat His	aat Asn	ggg Gly	tac Tyr	caa Gln 745	ttt Phe	tgg Trp	gtt Val	cca Pro	cag Gln 750	tta Leu	tca Ser	2256
tgt Cys	ggt Gly	gac Asp 755	cag Gln	gca Ala	aga Arg	gat Asp	tta Leu 760	cga Arg	tct Ser	ccc Pro	agg Arg	ata Ile 765	aag Lys	ggg Gly	ttt Phe	2304
att Ile	ctt Leu 770	tgg Trp	att Ile	tgt Cys	gtt Val 775	gtg Val	ttg Leu	ttt Phe	gcg Ala	ggt Gly	tct Ser 780	gta Val	att Ile	tct Ser	ctt Leu	2352
ggt Gly 785	gcg Ala	att Ile	ata Ile	tct Ser	gct Ala 790	aaa Lys	cct Pro	ttg Leu	gat Asp	gat Asp 795	tta Leu	aag Lys	tat Tyr	aag Lys	ctg Leu 800	2400
ttt Phe	agt Ser	gcc Ala	aga Arg	gaa Glu	aac Asn	aac Asn	gtc Val	acg Thr	tca Ser	cca Pro	tat Tyr	aca Thr	tct Ser	tct Ser	gta Val	2448

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810

805	810	815	
tac ctt ggt tgg gca atg tca tct gga att gct tta gta gtt acc gcc Tyr Leu Gly Trp 820 Ala Met Ser Ser Gly 825 Ile Ala Leu Val 830 Thr Ala			2496
att cta cca ata gtt tca tgg ttt gca act tat agg ttt tcc cac tct Ile Leu Pro 835 Ile Val Ser Trp Phe 840 Ala Thr Tyr Arg Phe 845 Ser His Ser			2544
tct gct gtc tgt ctc atg ata ttc tca gtt gtt ctc gtg gca ttt tgt Ser Ala Val Cys Leu Met Ile 855 Phe Ser Val Val 860 Leu Val Ala Phe Cys			2592
gga act tca tat ttg gaa gtt gta aaa tct aga gat gat cag ttg ccc Gly Thr Ser Tyr Leu 870 Glu Val Val Lys Ser Arg 875 Asp Asp Gln Leu Pro 880			2640
aca aag ggt gat ttc ctt gcg gcc ttg ctt cca ctt gca tgc att ccg Thr Lys Gly Asp Phe 885 Leu Ala Ala Leu 890 Leu Pro Leu Ala Cys 895 Ile Pro			2688
gcg ctg ctt tca cta tgc tgt ggg atg gtt aaa tgg aag gac gat tgt Ala Leu Leu 900 Ser Cys Cys Gly Met 905 Val Lys Trp Lys 910 Asp Asp Cys			2736
tgg ata ctc tct cga ggt gta tat gtt ttc ttt tca ata ggt ctt ctt Trp Ile Leu 915 Ser Arg Gly Val 920 Tyr Val Phe Phe Ser Ile 925 Gly Leu Leu			2784
ctt ctt ttt ggt gcg ata gca gct gtc att gca gtc aaa cca tgg acg Leu Leu Phe Gly Ala Ile 935 Ala Ala Val Ile 940 Ala Val Lys Pro Trp Thr			2832
ata ggc gta tct ttt ctc tta gtt ctt ttc ctt atg gtg gta aca att Ile Gly Val Ser Phe 950 Leu Leu Val Leu Phe 955 Leu Met Val Val Thr Ile 960			2880
ggt gta atc cat ctt tgg gcg tca aac aat ttc tat tta acc agg aaa Gly Val Ile His Leu 965 Trp Ala Ser Asn Asn Phe Tyr Leu Thr Arg 975 Lys			2928
cag aca tcc ttt gtc tgc ttt ctt gct ctt ctt ttg ggt ttg gcc gca Gln Thr Ser Phe 980 Val Cys Phe Leu 985 Ala Leu Leu Leu Gly 990 Leu Ala Ala			2976
ttc ctt ctc gga tgg cat caa gat aaa gca ttt gct gga gca tct gtt Phe Leu Leu 995 Gly Trp His Gln Asp 1000 Lys Ala Phe Ala Gly 1005 Ala Ser Val			3024
ggt tac ttt aca ttc ctg tct ctg ttg gct gga aga gca tta gct Gly Tyr Phe Thr Phe Leu Ser 1015 Leu Leu Ala Gly Arg 1020 Ala Leu Ala			3069
gtt ctt cta tcc cca cca att gta gta tat tct cca agg gtg cta Val Leu 1025 Leu Ser Pro Pro Ile 1030 Val Val Tyr Ser Pro 1035 Arg Val Leu			3114
cca gta tat gtc tac gat gct cat gct gat tgc gga aag aat gtc Pro Val 1040 Tyr Val Tyr Asp Ala 1045 His Ala Asp Cys Gly 1050 Lys Asn Val			3159
agt gct gca ttt ctt gtc ctg tat gga att gct ttg gca aca gaa			3204

Ser	Ala	Ala	Phe	Leu	Val	Leu	Tyr	Gly	Ile	Ala	Leu	Ala	Thr	Glu	
1055						1060					1065				
ggc	tgg	ggc	gtt	gtt	gct	agt	ctg	ata	att	tat	cct	ccg	ttt	gcg	3249
Gly	Trp	Gly	Val	Val	Ala	Ser	Leu	Ile	Ile	Tyr	Pro	Pro	Phe	Ala	
1070						1075					1080				
ggc	gct	gct	gta	tca	gct	atc	acc	ctt	gta	gta	gcc	ttt	ggg	ttt	3294
Gly	Ala	Ala	Val	Ser	Ala	Ile	Thr	Leu	Val	Val	Ala	Phe	Gly	Phe	
1085						1090					1095				
gct	gtt	tct	cgc	cca	tgt	ttg	act	ctt	gag	atg	atg	gag	gtt	gct	3339
Ala	Val	Ser	Arg	Pro	Cys	Leu	Thr	Leu	Glu	Met	Met	Glu	Val	Ala	
1100						1105					1110				
gta	cgc	ttt	ctt	agc	aag	gat	act	ata	gtg	caa	gct	atc	tct	cga	3384
Val	Arg	Phe	Leu	Ser	Lys	Asp	Thr	Ile	Val	Gln	Ala	Ile	Ser	Arg	
1115						1120					1125				
tct	gcc	acg	aaa	aca	aga	aat	gct	cta	tcc	ggc	acg	tat	tca	gct	3429
Ser	Ala	Thr	Lys	Thr	Arg	Asn	Ala	Leu	Ser	Gly	Thr	Tyr	Ser	Ala	
1130						1135					1140				
ccc	caa	agg	tcc	gcc	agc	tct	gca	gct	ctt	ctg	gtt	ggg	gat	ccc	3474
Pro	Gln	Arg	Ser	Ala	Ser	Ser	Ala	Ala	Leu	Leu	Val	Gly	Asp	Pro	
1145						1150					1155				
tct	gca	atg	cgt	gat	aaa	gca	ggg	aac	ttt	gtg	ctt	cct	aga	gat	3519
Ser	Ala	Met	Arg	Asp	Lys	Ala	Gly	Asn	Phe	Val	Leu	Pro	Arg	Asp	
1160						1165					1170				
gat	gtc	atg	aaa	tta	agg	gat	cgt	ctc	agg	aac	gaa	gaa	aga	gtt	3564
Asp	Val	Met	Lys	Leu	Arg	Asp	Arg	Leu	Arg	Asn	Glu	Glu	Arg	Val	
1175						1180					1185				
gct	gga	tca	atc	ttc	tac	aaa	atg	caa	tgc	agg	aaa	gga	ttc	cgt	3609
Ala	Gly	Ser	Ile	Phe	Tyr	Lys	Met	Gln	Cys	Arg	Lys	Gly	Phe	Arg	
1190						1195					1200				
cat	gaa	cca	cct	aca	aat	gta	gat	tat	aga	aga	gac	atg	tgt	gcc	3654
His	Glu	Pro	Pro	Thr	Asn	Val	Asp	Tyr	Arg	Arg	Asp	Met	Cys	Ala	
1205						1210					1215				
cat	gca	aga	gtt	ttg	gca	ctg	gaa	gag	gca	att	gat	aca	gaa	tgg	3699
His	Ala	Arg	Val	Leu	Ala	Leu	Glu	Glu	Ala	Ile	Asp	Thr	Glu	Trp	
1220						1225					1230				
gtg	tat	atg	tgg	gac	aaa	ttt	ggc	ggc	tat	tta	cta	cta	ttg	tta	3744
Val	Tyr	Met	Trp	Asp	Lys	Phe	Gly	Gly	Tyr	Leu	Leu	Leu	Leu	Leu	
1235						1240					1245				
ggc	ttg	aca	gct	aag	gcg	gag	aga	gtt	cag	gat	gag	gta	cgg	ttg	3789
Gly	Leu	Thr	Ala	Lys	Ala	Glu	Arg	Val	Gln	Asp	Glu	Val	Arg	Leu	
1250						1255					1260				
cgg	ctc	ttc	tta	gat	agc	att	ggg	ttc	tcg	gat	tta	agt	gcc	aga	3834
Arg	Leu	Phe	Leu	Asp	Ser	Ile	Gly	Phe	Ser	Asp	Leu	Ser	Ala	Arg	
1265						1270					1275				
aaa	atc	agt	aaa	tgg	aag	cca	gag	gat	aga	aga	caa	ttc	gaa	att	3879
Lys	Ile	Ser	Lys	Trp	Lys	Pro	Glu	Asp	Arg	Arg	Gln	Phe	Glu	Ile	
1280						1285					1290				

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att Ile	caa Gln 1295	gag Glu	agt Ser	tat Tyr	ctg Leu	aga Arg 1300	gag Glu	aaa Lys	gag Glu	atg Met	gaa Glu 1305	gag Glu	gaa Glu	agc Ser	3924
ctt Leu	atg Met 1310	cag Gln	aga Arg	cgt Arg	gaa Glu 1315	gaa Glu 1315	gaa Glu	ggg Gly	aga Arg	ggt Gly	aaa Lys 1320	gaa Glu	aga Arg	agg Arg	3969
aaa Lys	gct Ala 1325	ctt Leu	ttg Leu	gag Glu	aag Lys	gaa Glu 1330	gag Glu	cgc Arg	aaa Lys	tgg Trp	aag Lys 1335	gaa Glu	att Ile	gaa Glu	4014
gcg Ala	tcc Ser 1340	ctt Leu	att Ile	cca Pro	tct Ser	att Ile 1345	cct Pro	aat Asn	gct Ala	ggt Gly	agc Ser 1350	agg Arg	gag Glu	gca Ala	4059
gca Ala	gcc Ala 1355	atg Met	gca Ala	gct Ala	gca Ala	ata Ile 1360	cgt Arg	gct Ala	gtt Val	ggg Gly	ggt Gly 1365	gat Asp	tct Ser	gtc Val	4104
ctt Leu	gag Glu 1370	gat Asp	tcc Ser	ttc Phe	gca Ala	aga Arg 1375	gag Glu	agg Arg	gtc Val	tcg Ser	ggt Gly 1380	att Ile	gca Ala	cgt Arg	4149
agg Arg	ata Ile 1385	cgc Arg	act Thr	gct Ala	caa Gln	cta Leu 1390	gaa Glu	cga Arg	cgt Arg	gca Ala	caa Gln 1395	cag Gln	act Thr	gga Gly	4194
ata Ile	tct Ser 1400	ggg Gly	gca Ala	gtt Val	tgt Cys	gtt Val 1405	ctt Leu	gat Asp	gat Asp	gaa Glu	cca Pro 1410	atg Met	ata Ile	agt Ser	4239
ggt Gly	aaa Lys 1415	cat His	tgc Cys	ggc Gly	caa Gln	atg Met 1420	gac Asp	tca Ser	agt Ser	gtc Val	tgt Cys 1425	caa Gln	agt Ser	cag Gln	4284
aag Lys	att Ile 1430	agc Ser	ttt Phe	tcc Ser	gtt Val	aca Thr 1435	gca Ala	atg Met	atc Ile	caa Gln	tcc Ser 1440	gat Asp	tct Ser	gga Gly	4329
cct Pro	gta Val 1445	tgt Cys	ctt Leu	ttt Phe	ggc Gly	act Thr 1450	gaa Glu	ttt Phe	caa Gln	aag Lys	aaa Lys 1455	gta Val	tgt Cys	tgg Trp	4374
gag Glu	att Ile 1460	ctg Leu	gtt Val	gct Ala	ggt Gly	tct Ser 1465	gag Glu	caa Gln	gga Gly	att Ile	gag Glu 1470	gct Ala	ggc Gly	caa Gln	4419
gtt Val	ggg Gly 1475	ctt Leu	agg Arg	ttg Leu	ata Ile	aca Thr 1480	aaa Lys	ggt Gly	gag Glu	agg Arg	cag Gln 1485	aca Thr	acc Thr	gtt Val	4464
gct Ala	aga Arg 1490	gag Glu	tgg Trp	tat Tyr	att Ile	ggt Gly 1495	gca Ala	acc Thr	agc Ser	ata Ile	act Thr 1500	gat Asp	gga Gly	agg Arg	4509
tgg Trp	cat His 1505	aca Thr	gtg Val	aca Thr	atc Ile	aca Thr 1510	att Ile	gat Asp	gct Ala	gat Asp	gcg Ala 1515	ggg Gly	gaa Glu	gct Ala	4554
act Thr	tgt Cys 1520	tac Tyr	ata Ile	gat Asp	ggt Gly	ggg Gly 1525	ttt Phe	gat Asp	ggc Gly	tac Tyr	cag Gln 1530	aat Asn	ggg Gly	tta Leu	4599

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cct Pro	cta Leu 1535	agt Ser	att Ile	ggc Gly	agt Ser	gcc Ala 1540	att Ile	tgg Trp	gaa Glu	caa Gln	gga Gly 1545	gct Ala	gaa Glu	gtt Val	4644
tgg Trp	ttg Leu 1550	ggt Gly	gtt Val	agg Arg	cca Pro	cct Pro 1555	ata Ile	gat Asp	gtt Val	gat Asp	gca Ala 1560	ttc Phe	ggg Gly	aga Arg	4689
tca Ser	gat Asp 1565	agt Ser	gat Asp	ggc Gly	gtc Val	gaa Glu 1570	tca Ser	aag Lys	atg Met	cat His	att Ile 1575	atg Met	gat Asp	gtt Val	4734
ttc Phe	ctt Leu 1580	tgg Trp	ggg Gly	aaa Lys	tgc Cys	tta Leu 1585	agt Ser	gaa Glu	gaa Glu	gag Glu	gcc Ala 1590	gct Ala	tct Ser	ttg Leu	4779
cat His	gca Ala 1595	gcc Ala	att Ile	ggc Gly	atg Met	gct Ala 1600	gac Asp	tta Leu	gac Asp	atg Met	att Ile 1605	gat Asp	ttg Leu	tct Ser	4824
gat Asp	gac Asp 1610	aat Asn	tgg Trp	caa Gln	tgg Trp	acg Thr 1615	gat Asp	tca Ser	ccc Pro	ccc Pro	aga Arg 1620	gtc Val	gat Asp	ggt Gly	4869
tgg Trp	gat Asp 1625	agt Ser	gat Asp	cct Pro	gcc Ala	gat Asp 1630	gtt Val	gat Asp	ctc Leu	tat Tyr	gat Asp 1635	agg Arg	gat Asp	gac Asp	4914
gta Val	gat Asp 1640	tgg Trp	gat Asp	gga Gly	caa Gln	tat Tyr 1645	tcc Ser	agt Ser	ggg Gly	agg Arg	aaa Lys 1650	aga Arg	aga Arg	tca Ser	4959
ggt Gly	cgg Arg 1655	gat Asp	ttt Phe	gta Val	atg Met	agt Ser 1660	gtc Val	gat Asp	tcc Ser	ttt Phe	gcc Ala 1665	agg Arg	aga Arg	cac His	5004
agg Arg	aaa Lys 1670	ccc Pro	agg Arg	atg Met	gag Glu	aca Thr 1675	caa Gln	gaa Glu	gat Asp	ata Ile	aat Asn 1680	caa Gln	aga Arg	atg Met	5049
cgt Arg	tca Ser 1685	gtt Val	gag Glu	ttg Leu	gct Ala	gtc Val 1690	aaa Lys	gaa Glu	gct Ala	ctc Leu	tct Ser 1695	gca Ala	cga Arg	ggt Gly	5094
gat Asp	aag Lys 1700	caa Gln	ttt Phe	act Thr	gac Asp	cag Gln 1705	gaa Glu	ttt Phe	cct Pro	cca Pro	aat Asn 1710	gat Asp	cgc Arg	tct Ser	5139
tta Leu	ttt Phe 1715	gtg Val	gat Asp	aca Thr	caa Gln	aat Asn 1720	ccc Pro	cca Pro	tca Ser	aaa Lys	ttg Leu 1725	cag Gln	gtt Val	gtt Val	5184
tct Ser	gaa Glu 1730	tgg Trp	atg Met	aga Arg	cct Pro	gac Asp 1735	tcc Ser	att Ile	gtg Val	aaa Lys	gaa Glu 1740	aac Asn	ggt Gly	agt Ser	5229
gat Asp	tcc Ser 1745	cgt Arg	ccc Pro	tgc Cys	ctg Leu	ttc Phe 1750	tct Ser	ggg Gly	gat Asp	gca Ala	aat Asn 1755	cct Pro	tca Ser	gat Asp	5274
gtt Val	tgc Cys	cag Gln	ggg Gly	cgt Arg	ttg Leu	ggg Gly	gat Asp	tgt Cys	tgg Trp	ttc Phe	tta Leu	agc Ser	gcc Ala	gtt Val	5319

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1770

1760	gca Ala	gtt Val 1775	ttg Leu	aca Thr	gag Glu	gtt Val	tca Ser 1780	cga Arg	ata Ile	tct Ser	gaa Glu	gtg Val 1785	atc Ile	att Ile	act Thr	5364
	cct Pro	gaa Glu 1790	tac Tyr	aac Asn	gag Glu	gaa Glu	ggg Gly 1795	atc Ile	tac Tyr	act Thr	gtt Val	cgt Arg 1800	ttt Phe	tgt Cys	att Ile	5409
	cag Gln	ggg Gly 1805	gag Glu	tgg Trp	gtt Val	cct Pro	gtt Val 1810	gtt Val	atc Ile	gat Asp	gac Asp	tgg Trp 1815	att Ile	cca Pro	tgt Cys	5454
	gaa Glu	tca Ser 1820	cct Pro	ggg Gly	aaa Lys	cca Pro	gct Ala 1825	ttt Phe	gct Ala	act Thr	agc Ser	aga Arg 1830	aag Lys	ctc Leu	aat Asn	5499
	gaa Glu	ctc Leu 1835	tgg Trp	gtc Val	tcc Ser	atg Met	gtg Val 1840	gag Glu	aaa Lys	gca Ala	tat Tyr	gcc Ala 1845	aag Lys	ctc Leu	cat His	5544
	ggg Gly	tct Ser 1850	tat Tyr	gag Glu	gca Ala	ctg Leu	gag Glu 1855	ggg Gly	gga Gly	ctg Leu	gtt Val	cag Gln 1860	gat Asp	gct Ala	ctt Leu	5589
	gtc Val	gac Asp 1865	cta Leu	act Thr	gga Gly	gga Gly	gct Ala 1870	ggg Gly	gag Glu	gag Glu	att Ile	gac Asp 1875	ttg Leu	cgg Arg	agt Ser	5634
	gct Ala	caa Gln 1880	gca Ala	caa Gln	ata Ile	gat Asp	ctt Leu 1885	gca Ala	agt Ser	ggc Gly	aga Arg	ttg Leu 1890	tgg Trp	tct Ser	caa Gln	5679
	ttg Leu	tta Leu 1895	cgt Arg	ttt Phe	aaa Lys	caa Gln	gag Glu 1900	ggg Gly	ttc Phe	tta Leu	ctt Leu	ggg Gly 1905	gct Ala	gga Gly	agt Ser	5724
	cca Pro	tca Ser 1910	gga Gly	tct Ser	gat Asp	gtt Val	cat His 1915	gta Val	tct Ser	tcc Ser	agt Ser	ggc Gly 1920	att Ile	gtg Val	caa Gln	5769
	ggg Gly	cat His 1925	gct Ala	tac Tyr	tcc Ser	gtc Val	tta Leu 1930	cag Gln	gtg Val	aga Arg	gag Glu	gtt Val 1935	gat Asp	ggg Gly	cac His	5814
	aga Arg	ctt Leu 1940	gtt Val	cag Gln	att Ile	cga Arg	aat Asn 1945	cca Pro	tgg Trp	gct Ala	aat Asn	gaa Glu 1950	gtt Val	gag Glu	tgg Trp	5859
	aat Asn	ggg Gly 1955	ccc Pro	tgg Trp	tca Ser	gac Asp	tca Ser 1960	tcc Ser	cca Pro	gag Glu	tgg Trp	act Thr 1965	gat Asp	agg Arg	atg Met	5904
	aag Lys	cac His 1970	aag Lys	ctg Leu	aag Lys	cat His	gtt Val 1975	cca Pro	cag Gln	tca Ser	aaa Lys	gaa Glu 1980	ggg Gly	ata Ile	ttc Phe	5949
	tgg Trp	atg Met 1985	tct Ser	tgg Trp	caa Gln	gat Asp	ttc Phe 1990	cag Gln	att Ile	cat His	ttc Phe	aga Arg 1995	tca Ser	ata Ile	tat Tyr	5994
	gtg Trp	tgt Met	cgg Trp	gtt Trp	tac Gln	ccc Met	cgt Trp	gag Trp	atg Met	cgc Met	tac Met	tct Met	gta Trp	aat Met	ggc Met	6039

Val	Cys	Arg	Val	Tyr	Pro	Arg	Glu	Met	Arg	Tyr	Ser	Val	Asn	Gly	
	2000					2005					2010				
caa	tgg	cga	ggt	tat	agt	gcc	ggt	ggc	tgc	caa	gat	tat	agc	tca	6084
Gln	Trp	Arg	Gly	Tyr	Ser	Ala	Gly	Gly	Cys	Gln	Asp	Tyr	Ser	Ser	
	2015					2020					2025				
tgg	cat	caa	aat	cca	caa	ttc	agg	ctg	agg	gca	act	ggt	tct	gat	6129
Trp	His	Gln	Asn	Pro	Gln	Phe	Arg	Leu	Arg	Ala	Thr	Gly	Ser	Asp	
	2030					2035					2040				
gca	tct	tta	cca	att	cat	gtg	ttc	atc	acc	tta	act	cag	ggc	gta	6174
Ala	Ser	Leu	Pro	Ile	His	Val	Phe	Ile	Thr	Leu	Thr	Gln	Gly	Val	
	2045					2050					2055				
ggt	ttc	tcg	aga	aca	act	cct	gga	ttt	cgt	aac	tac	caa	tca	agc	6219
Gly	Phe	Ser	Arg	Thr	Thr	Pro	Gly	Phe	Arg	Asn	Tyr	Gln	Ser	Ser	
	2060					2065					2070				
cat	gat	tca	cag	ttg	ttc	tat	atc	gga	ttg	agg	att	ctt	aaa	act	6264
His	Asp	Ser	Gln	Leu	Phe	Tyr	Ile	Gly	Leu	Arg	Ile	Leu	Lys	Thr	
	2075					2080					2085				
cgt	gga	cgt	cgt	gct	gct	tac	aac	ata	ttt	ctt	cat	gaa	tct	gtt	6309
Arg	Gly	Arg	Arg	Ala	Ala	Tyr	Asn	Ile	Phe	Leu	His	Glu	Ser	Val	
	2090					2095					2100				
ggt	gga	aca	gac	tat	gtg	aat	tcc	cgt	gag	att	tca	tgt	gaa	atg	6354
Gly	Gly	Thr	Asp	Tyr	Val	Asn	Ser	Arg	Glu	Ile	Ser	Cys	Glu	Met	
	2105					2110					2115				
gtt	ctt	gac	cct	gat	cct	aag	ggt	tat	act	att	gtc	cca	acc	acg	6399
Val	Leu	Asp	Pro	Asp	Pro	Lys	Gly	Tyr	Thr	Ile	Val	Pro	Thr	Thr	
	2120					2125					2130				
ata	cac	cca	ggg	gaa	gaa	gca	cct	ttt	gtc	ctt	tca	gtc	ttc	aca	6444
Ile	His	Pro	Gly	Glu	Glu	Ala	Pro	Phe	Val	Leu	Ser	Val	Phe	Thr	
	2135					2140					2145				
aaa	gca	tcc	att	gtt	ctt	gaa	gct	ttg	tag						6474
Lys	Ala	Ser	Ile	Val	Leu	Glu	Ala	Leu							
	2150					2155									

&lt;210&gt; 16

&lt;211&gt; 2157

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (105)..(105)

&lt;223&gt; The 'Xaa' at location 105 stands for Ala, or Thr.

&lt;220&gt;



<221> misc\_feature

<222> (516)..(516)

<223> The 'Xaa' at location 516 stands for Glu, Ala, Gln, or Pro.

<220>

<221> misc\_feature

<222> (553)..(553)

<223> The 'Xaa' at location 553 stands for Leu.

<220>

<221> misc\_feature

<222> (1659)..(1659)

<223> Xaa= any amino acid

<400> 16

Met Glu Gly Asp Glu Arg Gly Val Leu Leu Ala Cys Val Ile Ser Gly  
1 5 10 15

Thr Leu Phe Thr Val Phe Gly Ser Gly Ser Phe Trp Ile Leu Trp Ala  
20 25 30

Val Asn Trp Arg Pro Trp Arg Leu Tyr Ser Trp Ile Phe Ala Arg Lys  
35 40 45

Trp Pro Lys Val Leu Gln Gly Pro Gln Leu Asp Ile Leu Cys Gly Val  
50 55 60

Leu Ser Leu Phe Ala Trp Ile Val Val Val Ser Pro Ile Ala Ile Leu  
65 70 75 80

Ile Gly Trp Gly Ser Trp Leu Ile Val Ile Leu Asp Arg His Ile Ile  
85 90 95

Gly Leu Ala Ile Ile Met Ala Gly Xaa Ala Leu Leu Leu Ala Phe Tyr  
100 105 110

Ser Ile Met Leu Trp Trp Arg Thr Gln Trp Gln Ser Ser Arg Ala Val  
115 120 125

Ala Leu Leu Leu Leu Leu Gly Val Ala Leu Leu Cys Ala Tyr Glu Leu  
130 135 140

Cys Ala Val Tyr Val Thr Ala Gly Ala His Ala Ser Gln Gln Tyr Ser  
145 150 155 160

Pro Ser Gly Phe Phe Phe Gly Val Ser Ala Ile Ala Leu Ala Ile Asn  
 165 170 175

Met Leu Phe Ile Cys Arg Met Val Phe Asn Gly Asn Gly Leu Asp Val  
 180 185 190

Asp Glu Tyr Val Arg Arg Ala Tyr Lys Phe Ala Tyr Ser Asp Cys Ile  
 195 200 205

Glu Val Gly Pro Val Ala Cys Leu Pro Glu Pro Pro Asp Pro Asn Glu  
 210 215 220

Leu Tyr Pro Arg Gln Thr Ser Arg Ala Ser His Leu Gly Leu Leu Tyr  
 225 230 235 240

Leu Gly Ser Leu Val Val Leu Leu Ala Tyr Ser Val Leu Tyr Gly Leu  
 245 250 255

Thr Ala Arg Glu Ser Arg Trp Leu Gly Gly Ile Thr Ser Ala Ala Val  
 260 265 270

Ile Val Leu Asp Trp Asn Ile Gly Ala Cys Leu Tyr Gly Phe Lys Leu  
 275 280 285

Leu Gln Asn Arg Val Leu Ala Leu Phe Val Ala Gly Ile Ser Arg Leu  
 290 295 300

Phe Leu Ile Cys Phe Gly Ile His Tyr Trp Tyr Leu Gly His Cys Ile  
 305 310 315 320

Ser Tyr Ile Phe Val Ala Ser Val Leu Ser Gly Ala Ala Val Ser Arg  
 325 330 335

His Leu Ser Ile Thr Asp Pro Ser Ala Ala Arg Arg Asp Ala Leu Gln  
 340 345 350

Ser Thr Val Ile Arg Leu Arg Glu Gly Phe Arg Arg Lys Glu Gln Asn  
 355 360 365

Ser Ser Ser Ser Ser Asp Gly Cys Gly Ser Ser Ile Lys Arg Ser  
 370 375 380

Ser Ser Ile Asp Ala Gly His Thr Gly Cys Thr Asn Glu Ala Asn Arg  
 385 390 395 400

Thr Ala Glu Ser Cys Thr Ala Asp Asn Leu Thr Arg Thr Gly Ser Ser  
 Page 54

405

415

Gln Glu Gly Ile Asn Ser Asp Lys Ser Glu Glu Ser Gly Arg Pro Ser  
420 425 430

Leu Gly Leu Arg Ser Ser Ser Cys Arg Ser Val Val Gln Glu Pro Glu  
435 440 445

Ala Gly Thr Ser Tyr Phe Met Asp Lys Val Ser Asp Gln Asn Asn Thr  
450 455 460

Leu Val Val Cys Ser Ser Ser Gly Leu Asp Ser Gln Gly Tyr Glu Ser  
465 470 475 480

Ser Thr Ser Asn Ser Ala Asn Gln Gln Leu Leu Asp Met Asn Leu Ala  
485 490 495

Leu Ala Phe Gln Asp Gln Leu Asn Asn Pro Arg Ile Ala Ser Ile Leu  
500 505 510

Lys Lys Lys Xaa Lys Glu Gly Asp Leu Glu Leu Thr Asn Leu Leu Gln  
515 520 525

Asp Lys Gly Leu Asp Pro Asn Phe Ala Val Met Leu Lys Glu Lys Asn  
530 535 540

Leu Asp Pro Gly Lys Asn Leu Gly Xaa Thr Ile Leu Ala Leu Leu Gln  
545 550 555 560

Arg Ser Ser Leu Asp Ala Asp Arg Asp His Arg Asp Asn Thr Asp Ile  
565 570 575

Thr Ile Ile Asp Ser Asn Ser Val Asp Asn Thr Leu Pro Asn Gln Ile  
580 585 590

Ser Leu Ser Glu Glu Leu Arg Leu Arg Gly Leu Glu Lys Trp Leu Lys  
595 600 605

Leu Ser Arg Leu Leu Leu His His Val Ala Gly Thr Pro Glu Arg Ala  
610 615 620

Trp Gly Leu Phe Ser Leu Val Phe Ile Leu Glu Thr Ile Ile Val Ala  
625 630 635 640

Ile Phe Arg Pro Lys Thr Ile Thr Ile Ile Asn Ser Ser His Gln Gln  
645 650 655

Phe Glu Phe Gly Phe Ser Val Leu Leu Leu Ser Pro Val Val Cys Ser  
660 665 670

Ile Met Ala Phe Leu Arg Ser Leu Gln Val Glu Glu Met Ala Leu Thr  
675 680 685

Ser Lys Ser Arg Lys Tyr Gly Phe Val Ala Trp Leu Leu Ser Thr Ser  
690 695 700

Val Gly Leu Ser Leu Ser Phe Leu Ser Lys Ser Ser Val Leu Leu Gly  
705 710 715 720

Ile Ser Leu Thr Val Pro Leu Met Ala Ala Cys Leu Ser Ile Ala Val  
725 730 735

Pro Ile Trp Met His Asn Gly Tyr Gln Phe Trp Val Pro Gln Leu Ser  
740 745 750

Cys Gly Asp Gln Ala Arg Asp Leu Arg Ser Pro Arg Ile Lys Gly Phe  
755 760 765

Ile Leu Trp Ile Cys Val Val Leu Phe Ala Gly Ser Val Ile Ser Leu  
770 775 780

Gly Ala Ile Ile Ser Ala Lys Pro Leu Asp Asp Leu Lys Tyr Lys Leu  
785 790 795 800

Phe Ser Ala Arg Glu Asn Asn Val Thr Ser Pro Tyr Thr Ser Ser Val  
805 810 815

Tyr Leu Gly Trp Ala Met Ser Ser Gly Ile Ala Leu Val Val Thr Ala  
820 825 830

Ile Leu Pro Ile Val Ser Trp Phe Ala Thr Tyr Arg Phe Ser His Ser  
835 840 845

Ser Ala Val Cys Leu Met Ile Phe Ser Val Val Leu Val Ala Phe Cys  
850 855 860

Gly Thr Ser Tyr Leu Glu Val Val Lys Ser Arg Asp Asp Gln Leu Pro  
865 870 875 880

Thr Lys Gly Asp Phe Leu Ala Ala Leu Leu Pro Leu Ala Cys Ile Pro  
885 890 895

Ala Leu Leu Ser Leu Cys Cys Gly Met Val Lys Trp Lys Asp Asp Cys  
900 905 910

Trp Ile Leu Ser Arg Gly Val Tyr Val Phe Phe Ser Ile Gly Leu Leu  
 915 920 925

Leu Leu Phe Gly Ala Ile Ala Ala Val Ile Ala Val Lys Pro Trp Thr  
 930 935 940

Ile Gly Val Ser Phe Leu Leu Val Leu Phe Leu Met Val Val Thr Ile  
 945 950 955 960

Gly Val Ile His Leu Trp Ala Ser Asn Asn Phe Tyr Leu Thr Arg Lys  
 965 970 975

Gln Thr Ser Phe Val Cys Phe Leu Ala Leu Leu Leu Gly Leu Ala Ala  
 980 985 990

Phe Leu Leu Gly Trp His Gln Asp Lys Ala Phe Ala Gly Ala Ser Val  
 995 1000 1005

Gly Tyr Phe Thr Phe Leu Ser Leu Leu Ala Gly Arg Ala Leu Ala  
 1010 1015 1020

Val Leu Leu Ser Pro Pro Ile Val Val Tyr Ser Pro Arg Val Leu  
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Pro Val Tyr Val Tyr Asp Ala His Ala Asp Cys Gly Lys Asn Val  
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Ser Ala Ala Phe Leu Val Leu Tyr Gly Ile Ala Leu Ala Thr Glu  
 1055 1060 1065

Gly Trp Gly Val Val Ala Ser Leu Ile Ile Tyr Pro Pro Phe Ala  
 1070 1075 1080

Gly Ala Ala Val Ser Ala Ile Thr Leu Val Val Ala Phe Gly Phe  
 1085 1090 1095

Ala Val Ser Arg Pro Cys Leu Thr Leu Glu Met Met Glu Val Ala  
 1100 1105 1110

Val Arg Phe Leu Ser Lys Asp Thr Ile Val Gln Ala Ile Ser Arg  
 1115 1120 1125

Ser Ala Thr Lys Thr Arg Asn Ala Leu Ser Gly Thr Tyr Ser Ala  
 1130 1135 1140

Pro Gln Arg Ser Ala Ser Ser Ala Ala Leu Leu Val Gly Asp Pro  
 1145 1150 1155

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Ser Ala Met Arg Asp Lys Ala Gly Asn Phe Val Leu Pro Arg Asp  
 1160 1165 1170  
 Asp Val Met Lys Leu Arg Asp Arg Leu Arg Asn Glu Glu Arg Val  
 1175 1180 1185  
 Ala Gly Ser Ile Phe Tyr Lys Met Gln Cys Arg Lys Gly Phe Arg  
 1190 1195 1200  
 His Glu Pro Pro Thr Asn Val Asp Tyr Arg Arg Asp Met Cys Ala  
 1205 1210 1215  
 His Ala Arg Val Leu Ala Leu Glu Glu Ala Ile Asp Thr Glu Trp  
 1220 1225 1230  
 Val Tyr Met Trp Asp Lys Phe Gly Gly Tyr Leu Leu Leu Leu Leu  
 1235 1240 1245  
 Gly Leu Thr Ala Lys Ala Glu Arg Val Gln Asp Glu Val Arg Leu  
 1250 1255 1260  
 Arg Leu Phe Leu Asp Ser Ile Gly Phe Ser Asp Leu Ser Ala Arg  
 1265 1270 1275  
 Lys Ile Ser Lys Trp Lys Pro Glu Asp Arg Arg Gln Phe Glu Ile  
 1280 1285 1290  
 Ile Gln Glu Ser Tyr Leu Arg Glu Lys Glu Met Glu Glu Glu Ser  
 1295 1300 1305  
 Leu Met Gln Arg Arg Glu Glu Glu Gly Arg Gly Lys Glu Arg Arg  
 1310 1315 1320  
 Lys Ala Leu Leu Glu Lys Glu Glu Arg Lys Trp Lys Glu Ile Glu  
 1325 1330 1335  
 Ala Ser Leu Ile Pro Ser Ile Pro Asn Ala Gly Ser Arg Glu Ala  
 1340 1345 1350  
 Ala Ala Met Ala Ala Ala Ile Arg Ala Val Gly Gly Asp Ser Val  
 1355 1360 1365  
 Leu Glu Asp Ser Phe Ala Arg Glu Arg Val Ser Gly Ile Ala Arg  
 1370 1375 1380  
 Arg Ile Arg Thr Ala Gln Leu Glu Arg Arg Ala Gln Gln Thr Gly

1385

1390

1395

Ile Ser Gly Ala Val Cys Val Leu Asp Asp Glu Pro Met Ile Ser  
 1400 1405 1410  
 Gly Lys His Cys Gly Gln Met Asp Ser Ser Val Cys Gln Ser Gln  
 1415 1420 1425  
 Lys Ile Ser Phe Ser Val Thr Ala Met Ile Gln Ser Asp Ser Gly  
 1430 1435 1440  
 Pro Val Cys Leu Phe Gly Thr Glu Phe Gln Lys Lys Val Cys Trp  
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 Glu Ile Leu Val Ala Gly Ser Glu Gln Gly Ile Glu Ala Gly Gln  
 1460 1465 1470  
 Val Gly Leu Arg Leu Ile Thr Lys Gly Glu Arg Gln Thr Thr Val  
 1475 1480 1485  
 Ala Arg Glu Trp Tyr Ile Gly Ala Thr Ser Ile Thr Asp Gly Arg  
 1490 1495 1500  
 Trp His Thr Val Thr Ile Thr Ile Asp Ala Asp Ala Gly Glu Ala  
 1505 1510 1515  
 Thr Cys Tyr Ile Asp Gly Gly Phe Asp Gly Tyr Gln Asn Gly Leu  
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 Pro Leu Ser Ile Gly Ser Ala Ile Trp Glu Gln Gly Ala Glu Val  
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 Trp Leu Gly Val Arg Pro Pro Ile Asp Val Asp Ala Phe Gly Arg  
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 Ser Asp Ser Asp Gly Val Glu Ser Lys Met His Ile Met Asp Val  
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 Phe Leu Trp Gly Lys Cys Leu Ser Glu Glu Glu Ala Ala Ser Leu  
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 His Ala Ala Ile Gly Met Ala Asp Leu Asp Met Ile Asp Leu Ser  
 1595 1600 1605  
 Asp Asp Asn Trp Gln Trp Thr Asp Ser Pro Pro Arg Val Asp Gly  
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Trp Asp Ser Asp Pro Ala Asp Val Asp Leu Tyr Asp Arg Asp Asp  
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 Val Asp Trp Asp Gly Gln Tyr Ser Ser Gly Arg Lys Arg Arg Ser  
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 Gly Arg Asp Phe Val Met Ser Val Asp Ser Phe Ala Arg Arg His  
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 Arg Lys Pro Arg Met Glu Thr Gln Glu Asp Ile Asn Gln Arg Met  
 1670 1675 1680  
 Arg Ser Val Glu Leu Ala Val Lys Glu Ala Leu Ser Ala Arg Gly  
 1685 1690 1695  
 Asp Lys Gln Phe Thr Asp Gln Glu Phe Pro Pro Asn Asp Arg Ser  
 1700 1705 1710  
 Leu Phe Val Asp Thr Gln Asn Pro Pro Ser Lys Leu Gln Val Val  
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 Ser Glu Trp Met Arg Pro Asp Ser Ile Val Lys Glu Asn Gly Ser  
 1730 1735 1740  
 Asp Ser Arg Pro Cys Leu Phe Ser Gly Asp Ala Asn Pro Ser Asp  
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 Val Cys Gln Gly Arg Leu Gly Asp Cys Trp Phe Leu Ser Ala Val  
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 Ala Val Leu Thr Glu Val Ser Arg Ile Ser Glu Val Ile Ile Thr  
 1775 1780 1785  
 Pro Glu Tyr Asn Glu Glu Gly Ile Tyr Thr Val Arg Phe Cys Ile  
 1790 1795 1800  
 Gln Gly Glu Trp Val Pro Val Val Ile Asp Asp Trp Ile Pro Cys  
 1805 1810 1815  
 Glu Ser Pro Gly Lys Pro Ala Phe Ala Thr Ser Arg Lys Leu Asn  
 1820 1825 1830  
 Glu Leu Trp Val Ser Met Val Glu Lys Ala Tyr Ala Lys Leu His  
 1835 1840 1845  
 Gly Ser Tyr Glu Ala Leu Glu Gly Gly Leu Val Gln Asp Ala Leu  
 1850 1855 1860



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Val Asp Leu Thr Gly Gly Ala Gly Glu Glu Ile Asp Leu Arg Ser  
 1865 1870 1875  
 Ala Gln Ala Gln Ile Asp Leu Ala Ser Gly Arg Leu Trp Ser Gln  
 1880 1885 1890  
 Leu Leu Arg Phe Lys Gln Glu Gly Phe Leu Leu Gly Ala Gly Ser  
 1895 1900 1905  
 Pro Ser Gly Ser Asp Val His Val Ser Ser Ser Gly Ile Val Gln  
 1910 1915 1920  
 Gly His Ala Tyr Ser Val Leu Gln Val Arg Glu Val Asp Gly His  
 1925 1930 1935  
 Arg Leu Val Gln Ile Arg Asn Pro Trp Ala Asn Glu Val Glu Trp  
 1940 1945 1950  
 Asn Gly Pro Trp Ser Asp Ser Ser Pro Glu Trp Thr Asp Arg Met  
 1955 1960 1965  
 Lys His Lys Leu Lys His Val Pro Gln Ser Lys Glu Gly Ile Phe  
 1970 1975 1980  
 Trp Met Ser Trp Gln Asp Phe Gln Ile His Phe Arg Ser Ile Tyr  
 1985 1990 1995  
 Val Cys Arg Val Tyr Pro Arg Glu Met Arg Tyr Ser Val Asn Gly  
 2000 2005 2010  
 Gln Trp Arg Gly Tyr Ser Ala Gly Gly Cys Gln Asp Tyr Ser Ser  
 2015 2020 2025  
 Trp His Gln Asn Pro Gln Phe Arg Leu Arg Ala Thr Gly Ser Asp  
 2030 2035 2040  
 Ala Ser Leu Pro Ile His Val Phe Ile Thr Leu Thr Gln Gly Val  
 2045 2050 2055  
 Gly Phe Ser Arg Thr Thr Pro Gly Phe Arg Asn Tyr Gln Ser Ser  
 2060 2065 2070  
 His Asp Ser Gln Leu Phe Tyr Ile Gly Leu Arg Ile Leu Lys Thr  
 2075 2080 2085  
 Arg Gly Arg Arg Ala Ala Tyr Asn Ile Phe Leu His Glu Ser Val  
 2090 2095 2100

Gly Gly Thr Asp Tyr Val Asn Ser Arg Glu Ile Ser Cys Glu Met  
 2105 2110 2115

Val Leu Asp Pro Asp Pro Lys Gly Tyr Thr Ile Val Pro Thr Thr  
 2120 2125 2130

Ile His Pro Gly Glu Glu Ala Pro Phe Val Leu Ser Val Phe Thr  
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Lys Ala Ser Ile Val Leu Glu Ala Leu  
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 Met Glu Thr Glu Ser Asp Asp Ala Thr Ile Thr Val Val Lys Asp Met  
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aga gtt cga tta gag aat cga att cga acc caa cac gac gct cac tta 96  
 Arg Val Arg Leu Glu Asn Arg Ile Arg Thr Gln His Asp Ala His Leu  
 20 25 30

gat ctc ctt tcc tca ctc caa tcc att gtt ccc gat ata gtc cca tct 144  
 Asp Leu Leu Ser Ser Leu Gln Ser Ile Val Pro Asp Ile Val Pro Ser  
 35 40 45

ctc gat ctc tca ctc aaa ctc atc tct tct ttc acg aat cga cct ttc 192  
 Leu Asp Leu Ser Leu Lys Leu Ile Ser Ser Phe Thr Asn Arg Pro Phe  
 50 55 60

gta gct aca cca cca tta cca gaa ccc aaa gtt gag aag aag cat cat 240  
 Val Ala Thr Pro Pro Leu Pro Glu Pro Lys Val Glu Lys Lys His His  
 65 70 75 80

ccg att gtt aaa tta gga acc caa ctg caa caa tta cat ggg cat gat 288  
 Pro Ile Val Lys Leu Gly Thr Gln Leu Gln Gln Leu His Gly His Asp  
 85 90 95

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tca aaa tcg atg ctt gtt gat tcg aat cag aga gat gct gaa gct gat Ser Lys Ser Met Leu Val Asp Ser Asn Gln Arg Asp Ala Glu Ala Asp 100 105 110	336
ggg tct agt ggg agt cct atg gcg ctt gtt aga gct atg gtt gct gag Gly Ser Ser Gly Ser Pro Met Ala Leu Val Arg Ala Met Val Ala Glu 115 120 125	384
tgt ttg ctt caa cgt gta ccg ttt tct cct acg gat tct tct act gtg Cys Leu Leu Gln Arg Val Pro Phe Ser Pro Thr Asp Ser Ser Thr Val 130 135 140	432
ctt agg aag ctt gag aat gac cag aat gct aga ccg gcg gag aag gcg Leu Arg Lys Leu Glu Asn Asp Gln Asn Ala Arg Pro Ala Glu Lys Ala 145 150 155 160	480
gcg tta cga gat tta ggc ggt gaa tgt gga ccg att ctt gcg gtg gag Ala Leu Arg Asp Leu Gly Gly Glu Cys Gly Pro Ile Leu Ala Val Glu 165 170 175	528
acc gca ctt aaa tcg atg gcg gaa gag aat ggt tct gtg gaa ttg gaa Thr Ala Leu Lys Ser Met Ala Glu Glu Asn Gly Ser Val Glu Leu Glu 180 185 190	576
gag ttt gag gtt agt ggg aag cct agg atc atg gtt tta gct ata gat Glu Phe Glu Val Ser Gly Lys Pro Arg Ile Met Val Leu Ala Ile Asp 195 200 205	624
aga act aga ttg ctt aaa gag tta cca gag agt ttc caa ggg aat aac Arg Thr Arg Leu Leu Lys Glu Leu Pro Glu Ser Phe Gln Gly Asn Asn 210 215 220	672
gaa tcg aat cgg gtt gtc gaa acg cct aat tca att gag aat gct act Glu Ser Asn Arg Val Val Glu Thr Pro Asn Ser Ile Glu Asn Ala Thr 225 230 235 240	720
gtt tct ggt ggc ggg ttt ggt gtt tcc ggg tcg ggt aat ttc ccg aga Val Ser Gly Gly Gly Phe Gly Val Ser Gly Ser Gly Asn Phe Pro Arg 245 250 255	768
cct gag atg tgg gga ggt gat cct aat atg ggg ttt agg cca atg atg Pro Glu Met Trp Gly Gly Asp Pro Asn Met Gly Phe Arg Pro Met Met 260 265 270	816
aat gca cca aga gga atg caa atg atg gga atg cat cat cca atg ggg Asn Ala Pro Arg Gly Met Gln Met Met Gly Met His His Pro Met Gly 275 280 285	864
ata atg ggt aga cca cca cca ttt cct ttg cct ttg ccg ttg cct gta Ile Met Gly Arg Pro Pro Pro Phe Pro Leu Pro Leu Pro Leu Pro Val 290 295 300	912
ccg tcg aat cag aag ctt aga agt gag gaa gag gat ttg aaa gat gtt Pro Ser Asn Gln Lys Leu Arg Ser Glu Glu Glu Asp Leu Lys Asp Val 305 310 315 320	960
gag gct ctt ttg agt aag aag tct ttt aag gag aag caa cag tct agg Glu Ala Leu Leu Ser Lys Lys Ser Phe Lys Glu Lys Gln Gln Ser Arg 325 330 335	1008
aca ggt gag gag ttg ctt gat ctg att cac cgt cca acc gct aaa gaa Thr Gly Glu Glu Leu Leu Asp Leu Ile His Arg Pro Thr Ala Lys Glu 340 345 350	1056

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gcc gct act gct gct aag ttt aaa agc aaa gga gga tca cag gtt aag Ala Ala Thr Ala Ala Lys Phe Lys Ser Lys Gly Gly Ser Gln Val Lys 355 360 365	1104
tat tac tgt agg tat tta act aaa gag gat tgc cgt ctt cag tct ggt Tyr Tyr Cys Arg Tyr Leu Thr Lys Glu Asp Cys Arg Leu Gln Ser Gly 370 375 380	1152
tct cac ata gcc tgc aac aag aga cat ttc cgt cga cta atc gct tca Ser His Ile Ala Cys Asn Lys Arg His Phe Arg Arg Leu Ile Ala Ser 385 390 395 400	1200
cat act gac gtt agc cta gga gat tgt tcc ttt ctc gat act tgt cgt His Thr Asp Val Ser Leu Gly Asp Cys Ser Phe Leu Asp Thr Cys Arg 405 410 415	1248
cac atg aag act tgc aaa tac gtg cat tac gag ctc gac atg gct gac His Met Lys Thr Cys Lys Tyr Val His Tyr Glu Leu Asp Met Ala Asp 420 425 430	1296
gct atg atg gct ggt cca gat aag gca ttg aag cct cta cgt gct gat Ala Met Met Ala Gly Pro Asp Lys Ala Leu Lys Pro Leu Arg Ala Asp 435 440 445	1344
tac tgt tct gaa gct gaa ctt ggt gag gca caa tgg att aac tgt gac Tyr Cys Ser Glu Ala Glu Leu Gly Glu Ala Gln Trp Ile Asn Cys Asp 450 455 460	1392
atc cgt tct ttt cga atg gac att ttg gga acc ttt gga gtt gtt atg Ile Arg Ser Phe Arg Met Asp Ile Leu Gly Thr Phe Gly Val Val Met 465 470 475 480	1440
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gta aag aca aat caa ctt caa cgt att att cga aca gga aga aca ggt Val Lys Thr Asn Gln Leu Gln Arg Ile Ile Arg Thr Gly Arg Thr Gly 545 550 555 560	1680
cac tgg ctc aac cat agc aaa gag cat tgt ctg gtt gga atc aaa gga His Trp Leu Asn His Ser Lys Glu His Cys Leu Val Gly Ile Lys Gly 565 570 575	1728
aat cca gaa gtg aac aga aac atc gac aca gat gtg att gtc gca gag Asn Pro Glu Val Asn Arg Asn Ile Asp Thr Asp Val Ile Val Ala Glu 580 585 590	1776
ggt aga gaa aca agc cgg aag cca gac gag atg tat gca atg tta gag Val Arg Glu Thr Ser Arg Lys Pro Asp Glu Met Tyr Ala Met Leu Glu 595 600 605	1824

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595

600

605

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 Arg Ile Met Pro Arg Ala Arg Lys Leu Glu Leu Phe Ala Arg Met His  
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aat gct cat gcc gga tgg cta tca ctt ggg aac cag ctt aac ggt gtc 1920  
 Asn Ala His Ala Gly Trp Leu Ser Leu Gly Asn Gln Leu Asn Gly Val  
 625 630 635 640

cga tta ata aac gaa ggt ctt cga gct cgg ttt aaa gca tca tac cct 1968  
 Arg Leu Ile Asn Glu Gly Leu Arg Ala Arg Phe Lys Ala Ser Tyr Pro  
 645 650 655

gaa ata gat gtc cag cca cca tca cca cca aga gcc tct gca atg gaa 2016  
 Glu Ile Asp Val Gln Pro Pro Ser Pro Pro Arg Ala Ser Ala Met Glu  
 660 665 670

aca gac aac gaa cca atg gct att gac tca atc aca gct tag 2058  
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Arg Val Arg Leu Glu Asn Arg Ile Arg Thr Gln His Asp Ala His Leu  
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 35 40 45

Leu Asp Leu Ser Leu Lys Leu Ile Ser Ser Phe Thr Asn Arg Pro Phe  
 50 55 60

Val Ala Thr Pro Pro Leu Pro Glu Pro Lys Val Glu Lys Lys His His  
 65 70 75 80

Pro Ile Val Lys Leu Gly Thr Gln Leu Gln Gln Leu His Gly His Asp  
 85 90 95

Ser Lys Ser Met Leu Val Asp Ser Asn Gln Arg Asp Ala Glu Ala Asp  
 100 105 110

Gly Ser Ser Gly Ser Pro Met Ala Leu Val Arg Ala Met Val Ala Glu  
 115 120 125

Cys Leu Leu Gln Arg Val Pro Phe Ser Pro Thr Asp Ser Ser Thr Val  
 130 135 140

Leu Arg Lys Leu Glu Asn Asp Gln Asn Ala Arg Pro Ala Glu Lys Ala  
 145 150 155 160

Ala Leu Arg Asp Leu Gly Gly Glu Cys Gly Pro Ile Leu Ala Val Glu  
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Thr Ala Leu Lys Ser Met Ala Glu Glu Asn Gly Ser Val Glu Leu Glu  
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Glu Phe Glu Val Ser Gly Lys Pro Arg Ile Met Val Leu Ala Ile Asp  
 195 200 205

Arg Thr Arg Leu Leu Lys Glu Leu Pro Glu Ser Phe Gln Gly Asn Asn  
 210 215 220

Glu Ser Asn Arg Val Val Glu Thr Pro Asn Ser Ile Glu Asn Ala Thr  
 225 230 235 240

Val Ser Gly Gly Gly Phe Gly Val Ser Gly Ser Gly Asn Phe Pro Arg  
 245 250 255

Pro Glu Met Trp Gly Gly Asp Pro Asn Met Gly Phe Arg Pro Met Met  
 260 265 270

Asn Ala Pro Arg Gly Met Gln Met Met Gly Met His His Pro Met Gly  
 275 280 285

Ile Met Gly Arg Pro Pro Pro Phe Pro Leu Pro Leu Pro Leu Pro Val  
 290 295 300

Pro Ser Asn Gln Lys Leu Arg Ser Glu Glu Glu Asp Leu Lys Asp Val  
 305 310 315 320

Glu Ala Leu Leu Ser Lys Lys Ser Phe Lys Glu Lys Gln Gln Ser Arg  
 325 330 335

Thr Gly Glu Glu Leu Leu Asp Leu Ile His Arg Pro Thr Ala Lys Glu  
 340 345 350

Ala Ala Thr Ala Ala Lys Phe Lys Ser Lys Gly Gly Ser Gln Val Lys  
 355 360 365

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Tyr Tyr Cys Arg Tyr Leu Thr Lys Glu Asp Cys Arg Leu Gln Ser Gly  
 370 375 380

Ser His Ile Ala Cys Asn Lys Arg His Phe Arg Arg Leu Ile Ala Ser  
 385 390 395 400

His Thr Asp Val Ser Leu Gly Asp Cys Ser Phe Leu Asp Thr Cys Arg  
 405 410 415

His Met Lys Thr Cys Lys Tyr Val His Tyr Glu Leu Asp Met Ala Asp  
 420 425 430

Ala Met Met Ala Gly Pro Asp Lys Ala Leu Lys Pro Leu Arg Ala Asp  
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Tyr Cys Ser Glu Ala Glu Leu Gly Glu Ala Gln Trp Ile Asn Cys Asp  
 450 455 460

Ile Arg Ser Phe Arg Met Asp Ile Leu Gly Thr Phe Gly Val Val Met  
 465 470 475 480

Ala Asp Pro Pro Trp Asp Ile His Met Glu Leu Pro Tyr Gly Thr Met  
 485 490 495

Ala Asp Asp Glu Met Arg Thr Leu Asn Val Pro Ser Leu Gln Thr Asp  
 500 505 510

Gly Leu Ile Phe Leu Trp Val Thr Gly Arg Ala Met Glu Leu Gly Arg  
 515 520 525

Glu Cys Leu Glu Leu Trp Gly Tyr Lys Arg Val Glu Glu Ile Ile Trp  
 530 535 540

Val Lys Thr Asn Gln Leu Gln Arg Ile Ile Arg Thr Gly Arg Thr Gly  
 545 550 555 560

His Trp Leu Asn His Ser Lys Glu His Cys Leu Val Gly Ile Lys Gly  
 565 570 575

Asn Pro Glu Val Asn Arg Asn Ile Asp Thr Asp Val Ile Val Ala Glu  
 580 585 590

Val Arg Glu Thr Ser Arg Lys Pro Asp Glu Met Tyr Ala Met Leu Glu  
 595 600 605

Arg Ile Met Pro Arg Ala Arg Lys Leu Glu Leu Phe Ala Arg Met His  
 610 615 620

Asn Ala His Ala Gly Trp Leu Ser Leu Gly Asn Gln Leu Asn Gly Val  
625 630 635 640

Arg Leu Ile Asn Glu Gly Leu Arg Ala Arg Phe Lys Ala Ser Tyr Pro  
645 650 655

Glu Ile Asp Val Gln Pro Pro Ser Pro Pro Arg Ala Ser Ala Met Glu  
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Thr Asp Asn Glu Pro Met Ala Ile Asp Ser Ile Thr Ala  
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ccg	gaa	ttt	gaa	cca	gat	atg	gag	aag	att	aaa	cgg	agg	ctg	ctc	aag	96
Pro	Glu	Phe	Glu	Pro	Asp	Met	Glu	Lys	Ile	Lys	Arg	Arg	Leu	Leu	Lys	
			20					25					30			

tac	ggt	gtt	gat	cca	acc	ccc	aaa	atc	ctg	aac	aat	ctc	cga	aag	aaa	144
Tyr	Gly	Val	Asp	Pro	Thr	Pro	Lys	Ile	Leu	Asn	Asn	Leu	Arg	Lys	Lys	
		35					40					45				

gaa	att	caa	aaa	cac	aac	cgt	aga	acc	aag	cgc	gaa	acc	gag	tcc	gag	192
Glu	Ile	Gln	Lys	His	Asn	Arg	Arg	Thr	Lys	Arg	Glu	Thr	Glu	Ser	Glu	
	50					55					60					

gcg	gag	gtg	tat	acg	gag	gcg	cag	aaa	caa	tca	atg	gag	gaa	gaa	gct	240
Ala	Glu	Val	Tyr	Thr	Glu	Ala	Gln	Lys	Gln	Ser	Met	Glu	Glu	Glu	Ala	
65					70					75					80	

cgt	ttt	caa	acc	ctt	aga	cgg	gaa	tac	aag	caa	ttc	acg	agg	tca	att	288
Arg	Phe	Gln	Thr	Leu	Arg	Arg	Glu	Tyr	Lys	Gln	Phe	Thr	Arg	Ser	Ile	
				85					90					95		



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gaa Glu	gga Gly	atc Ile 115	gag Glu	aga Arg	gtg Val	aag Lys	ctg Leu 120	aag Lys	gag Glu	ctc Leu	gtt Val	agt Ser 125	ggc Gly	gtt Val	cgg Arg	384
aga Arg	gaa Glu 130	gag Glu	gtt Val	agt Ser	gct Ala	ggt Gly 135	gaa Glu	ttg Leu	aag Lys	aaa Lys	gag Glu 140	aat Asn	cta Leu	aaa Lys	gag Glu	432
ttg Leu 145	aag Lys	aag Lys	ata Ile	ctt Leu	gag Glu 150	aag Lys	gat Asp	ctt Leu	cgt Arg	tgg Trp 155	gtt Val	cta Leu	gac Asp	gac Asp	gac Asp 160	480
gtt Val	gat Asp	gtg Val	gaa Glu 165	gaa Glu	ttt Phe	gat Asp	ttg Leu	gac Asp 170	aaa Lys	gaa Glu	ttt Phe	gat Asp	cct Pro	gcg Ala 175	aaa Lys	528
cgg Arg	tgg Trp	cgt Arg	aac Asn 180	gaa Glu	gga Gly	gaa Glu	gca Ala	gtc Val 185	aga Arg	gtt Val	ctc Leu	gtt Val	gac Asp 190	aga Arg	ttg Leu	576
agt Ser	ggt Gly	aga Arg 195	gaa Glu	atc Ile	aat Asn	gag Glu	aag Lys 200	cat His	tgg Trp	aag Lys	ttt Phe	gtg Val 205	aga Arg	atg Met	atg Met	624
aat Asn 210	caa Gln	tca Ser	ggg Gly	ctt Leu	cag Gln	ttc Phe 215	act Thr	gaa Glu	gat Asp	cag Gln	atg Met 220	ctt Leu	aag Lys	atc Ile	gtt Val	672
gat Asp 225	cga Arg	ttg Leu	gga Gly	cgt Arg	aaa Lys 230	cag Gln	agc Ser	tgg Trp	aaa Lys	caa Gln 235	gct Ala	tca Ser	gct Ala	gtt Val	gtt Val 240	720
cat His	tgg Trp	gtg Val	tat Tyr	tct Ser 245	gat Asp	aaa Lys	aag Lys	cgt Arg	aaa Lys 250	cat His	ctt Leu	agg Arg	agc Ser	aga Arg 255	ttt Phe	768
gtt Val	tac Tyr	acc Thr	aag Lys 260	ctt Leu	ttg Leu	tcc Ser	gtt Val	ctt Leu 265	ggg Gly	ttt Phe	gcg Ala	agg Arg	agg Arg 270	cca Pro	cag Gln	816
gaa Glu	gct Ala 275	ctt Leu	cag Gln	ata Ile	ttc Phe	aat Asn	cag Gln 280	atg Met	ctt Leu	ggt Gly	gat Asp	cgc Arg 285	cag Gln	tta Leu	tat Tyr	864
cct Pro 290	gat Asp	atg Met	gcg Ala	gcg Ala	tac Tyr	cac His 295	tgt Cys	att Ile	gct Ala	gta Val	aca Thr 300	ctt Leu	ggg Gly	caa Gln	gcg Ala	912
ggt Gly 305	tta Leu	ttg Leu	aag Lys	gag Glu	ttg Leu 310	ctt Leu	aaa Lys	gta Val	atc Ile	gag Glu 315	cgt Arg	atg Met	agg Arg	cag Gln	aaa Lys 320	960
ccg Pro	act Thr	aaa Lys	cta Leu	act Thr 325	aag Lys	aat Asn	ttg Leu	cgg Arg	caa Gln 330	aag Lys	aac Asn	tgg Trp	gat Asp	cct Pro 335	gtg Val	1008
ctt Leu	gaa Glu	cct Pro	gac Asp 340	ttg Leu	gtt Val	gta Val	tac Tyr	aac Asn 345	gct Ala	att Ile	ctt Leu	aac Asn	gct Ala 350	tgt Cys	gtt Val	1056

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cca	aca	ctc	caa	tgg	aag	gct	gtt	tca	tgg	gta	ttt	gta	gag	tta	aga	1104
Pro	Thr	Leu	Gln	Trp	Lys	Ala	Val	Ser	Trp	Val	Phe	Val	Glu	Leu	Arg	
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aaa	aat	ggt	ttg	agg	cct	aat	gga	gct	aca	tat	ggg	ctt	gcg	atg	gag	1152
Lys	Asn	Gly	Leu	Arg	Pro	Asn	Gly	Ala	Thr	Tyr	Gly	Leu	Ala	Met	Glu	
	370					375					380					
gtt	atg	ctg	gag	tca	ggg	aag	ttt	gat	cgt	gtt	cac	gat	ttt	ttt	agg	1200
Val	Met	Leu	Glu	Ser	Gly	Lys	Phe	Asp	Arg	Val	His	Asp	Phe	Phe	Arg	
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Lys	Met	Lys	Ser	Ser	Gly	Glu	Ala	Pro	Lys	Ala	Ile	Thr	Tyr	Lys	Val	
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ctt	gtc	cga	gct	ctc	tgg	aga	gaa	ggc	aag	atc	gaa	gaa	gct	gtt	gaa	1296
Leu	Val	Arg	Ala	Leu	Trp	Arg	Glu	Gly	Lys	Ile	Glu	Glu	Ala	Val	Glu	
			420					425					430			
gca	gtc	aga	gat	atg	gaa	caa	aag	gga	gtt	ata	gga	acg	ggt	tca	gtt	1344
Ala	Val	Arg	Asp	Met	Glu	Gln	Lys	Gly	Val	Ile	Gly	Thr	Gly	Ser	Val	
		435					440					445				
tac	tat	gaa	ttg	gca	tgc	tgt	ctg	tgc	aac	aac	ggg	cgt	tgg	tgc	gat	1392
Tyr	Tyr	Glu	Leu	Ala	Cys	Cys	Leu	Cys	Asn	Asn	Gly	Arg	Trp	Cys	Asp	
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gca	atg	ctc	gaa	gtg	ggg	agg	atg	aaa	aga	ctt	gaa	aat	tgc	agg	ccg	1440
Ala	Met	Leu	Glu	Val	Gly	Arg	Met	Lys	Arg	Leu	Glu	Asn	Cys	Arg	Pro	
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ctc	gag	att	acc	ttc	aca	gga	ctc	ata	gcc	gct	tca	ttg	aac	ggt	ggt	1488
Leu	Glu	Ile	Thr	Phe	Thr	Gly	Leu	Ile	Ala	Ala	Ser	Leu	Asn	Gly	Gly	
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cat	gtt	gat	gat	tgc	atg	gct	ata	ttc	caa	tat	atg	aaa	gat	aaa	tgt	1536
His	Val	Asp	Asp	Cys	Met	Ala	Ile	Phe	Gln	Tyr	Met	Lys	Asp	Lys	Cys	
			500					505					510			
gat	ccg	aat	ata	gga	act	gcg	aac	atg	atg	ctt	aaa	gtt	tac	gga	agg	1584
Asp	Pro	Asn	Ile	Gly	Thr	Ala	Asn	Met	Met	Leu	Lys	Val	Tyr	Gly	Arg	
		515					520					525				
aat	gat	atg	ttt	tca	gaa	gct	aaa	gaa	ttg	ttt	gaa	gag	att	gtc	agc	1632
Asn	Asp	Met	Phe	Ser	Glu	Ala	Lys	Glu	Leu	Phe	Glu	Glu	Ile	Val	Ser	
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aga	aaa	gag	act	cat	tta	gtt	cca	aac	gag	tat	aca	tac	agc	ttc	atg	1680
Arg	Lys	Glu	Thr	His	Leu	Val	Pro	Asn	Glu	Tyr	Thr	Tyr	Ser	Phe	Met	
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ctt	gaa	gct	tca	gct	aga	tca	ctg	caa	tgg	gaa	tac	ttt	gaa	cat	gtg	1728
Leu	Glu	Ala	Ser	Ala	Arg	Ser	Leu	Gln	Trp	Glu	Tyr	Phe	Glu	His	Val	
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tat	caa	acg	atg	gtt	ctt	tct	ggt	tac	caa	atg	gat	caa	aca	aaa	cat	1776
Tyr	Gln	Thr	Met	Val	Leu	Ser	Gly	Tyr	Gln	Met	Asp	Gln	Thr	Lys	His	
			580					585					590			
gca	tca	atg	ctg	ata	gaa	gca	tca	aga	gcc	ggg	aag	tgg	agt	ctt	cta	1824
Ala	Ser	Met	Leu	Ile	Glu	Ala	Ser	Arg	Ala	Gly	Lys	Trp	Ser	Leu	Leu	

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595	600	605	
gag cat gcc ttc gat gca gta ctt gaa gat gga gaa atc cct cac cca Glu His Ala Phe Asp Ala Val Leu Glu Asp Gly Glu Ile Pro His Pro 610 615 620			1872
ttg ttc ttc act gaa ctg ttg tgt cat gcc aca gct aaa ggc gat ttc Leu Phe Phe Thr Glu Leu Leu Cys His Ala Thr Ala Lys Gly Asp Phe 625 630 635 640			1920
caa aga gct atc aca ctg att aac act gtg gct ctc gca tct ttc cag Gln Arg Ala Ile Thr Leu Ile Asn Thr Val Ala Leu Ala Ser Phe Gln 645 650 655			1968
att agt gaa gaa gaa tgg act gat ctt ttt gag gag cat caa gac tgg Ile Ser Glu Glu Glu Trp Thr Asp Leu Phe Glu Glu His Gln Asp Trp 660 665 670			2016
ctt act caa gat aat ctt cat aag ctc tcg gat cat ctc att gag tgt Leu Thr Gln Asp Asn Leu His Lys Leu Ser Asp His Leu Ile Glu Cys 675 680 685			2064
gat tat gta agt gaa cca acg gtc tca aac ctc tca aag tca ttg aaa Asp Tyr Val Ser Glu Pro Thr Val Ser Asn Leu Ser Lys Ser Leu Lys 690 695 700			2112
tct cga tgt ggg tct tct tct tct tca gca caa cca ttg tta gcc gta Ser Arg Cys Gly Ser Ser Ser Ser Ser Ala Gln Pro Leu Leu Ala Val 705 710 715 720			2160
gat gta aca act caa agt cag ggc gaa aaa ccg gag gaa gat ttg ctt Asp Val Thr Thr Gln Ser Gln Gly Glu Lys Pro Glu Glu Asp Leu Leu 725 730 735			2208
ctg caa gat aca aca atg gaa gat gat aat agt gct aat ggt gaa gct Leu Gln Asp Thr Thr Met Glu Asp Asp Asn Ser Ala Asn Gly Glu Ala 740 745 750			2256
ttg gaa ttt aca gag act gaa ctc gaa acg ttg ggt cta gaa gaa ctc Trp Glu Phe Thr Glu Thr Glu Leu Glu Thr Leu Gly Leu Glu Glu Leu 755 760 765			2304
gag att gat gat gat gaa gaa tct agc gac tct gat tca ctt tca gtt Glu Ile Asp Asp Asp Glu Glu Ser Ser Asp Ser Asp Ser Leu Ser Val 770 775 780			2352
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<211> 798

<212> PRT

<213> Arabidopsis thaliana

<400> 20

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 Pro Glu Phe Glu Pro Asp Met Glu Lys Ile Lys Arg Arg Leu Leu Lys  
 20 25 30  
 Tyr Gly Val Asp Pro Thr Pro Lys Ile Leu Asn Asn Leu Arg Lys Lys  
 35 40 45  
 Glu Ile Gln Lys His Asn Arg Arg Thr Lys Arg Glu Thr Glu Ser Glu  
 50 55 60  
 Ala Glu Val Tyr Thr Glu Ala Gln Lys Gln Ser Met Glu Glu Glu Ala  
 65 70 75 80  
 Arg Phe Gln Thr Leu Arg Arg Glu Tyr Lys Gln Phe Thr Arg Ser Ile  
 85 90 95  
 Ser Gly Lys Arg Gly Gly Asp Val Gly Leu Met Val Gly Asn Pro Trp  
 100 105 110  
 Glu Gly Ile Glu Arg Val Lys Leu Lys Glu Leu Val Ser Gly Val Arg  
 115 120 125  
 Arg Glu Glu Val Ser Ala Gly Glu Leu Lys Lys Glu Asn Leu Lys Glu  
 130 135 140  
 Leu Lys Lys Ile Leu Glu Lys Asp Leu Arg Trp Val Leu Asp Asp Asp  
 145 150 155 160  
 Val Asp Val Glu Glu Phe Asp Leu Asp Lys Glu Phe Asp Pro Ala Lys  
 165 170 175  
 Arg Trp Arg Asn Glu Gly Glu Ala Val Arg Val Leu Val Asp Arg Leu  
 180 185 190  
 Ser Gly Arg Glu Ile Asn Glu Lys His Trp Lys Phe Val Arg Met Met  
 195 200 205  
 Asn Gln Ser Gly Leu Gln Phe Thr Glu Asp Gln Met Leu Lys Ile Val  
 210 215 220  
 Asp Arg Leu Gly Arg Lys Gln Ser Trp Lys Gln Ala Ser Ala Val Val  
 225 230 235 240  
 His Trp Val Tyr Ser Asp Lys Lys Arg Lys His Leu Arg Ser Arg Phe  
 245 250 255

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Val Tyr Thr Lys Leu Leu Ser Val Leu Gly Phe Ala Arg Arg Pro Gln  
 260 265 270

Glu Ala Leu Gln Ile Phe Asn Gln Met Leu Gly Asp Arg Gln Leu Tyr  
 275 280 285

Pro Asp Met Ala Ala Tyr His Cys Ile Ala Val Thr Leu Gly Gln Ala  
 290 295 300

Gly Leu Leu Lys Glu Leu Leu Lys Val Ile Glu Arg Met Arg Gln Lys  
 305 310 315 320

Pro Thr Lys Leu Thr Lys Asn Leu Arg Gln Lys Asn Trp Asp Pro Val  
 325 330 335

Leu Glu Pro Asp Leu Val Val Tyr Asn Ala Ile Leu Asn Ala Cys Val  
 340 345 350

Pro Thr Leu Gln Trp Lys Ala Val Ser Trp Val Phe Val Glu Leu Arg  
 355 360 365

Lys Asn Gly Leu Arg Pro Asn Gly Ala Thr Tyr Gly Leu Ala Met Glu  
 370 375 380

Val Met Leu Glu Ser Gly Lys Phe Asp Arg Val His Asp Phe Phe Arg  
 385 390 395 400

Lys Met Lys Ser Ser Gly Glu Ala Pro Lys Ala Ile Thr Tyr Lys Val  
 405 410 415

Leu Val Arg Ala Leu Trp Arg Glu Gly Lys Ile Glu Glu Ala Val Glu  
 420 425 430

Ala Val Arg Asp Met Glu Gln Lys Gly Val Ile Gly Thr Gly Ser Val  
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Tyr Tyr Glu Leu Ala Cys Cys Leu Cys Asn Asn Gly Arg Trp Cys Asp  
 450 455 460

Ala Met Leu Glu Val Gly Arg Met Lys Arg Leu Glu Asn Cys Arg Pro  
 465 470 475 480

Leu Glu Ile Thr Phe Thr Gly Leu Ile Ala Ala Ser Leu Asn Gly Gly  
 485 490 495

His Val Asp Asp Cys Met Ala Ile Phe Gln Tyr Met Lys Asp Lys Cys  
 500 505 510

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Asp Pro Asn Ile Gly Thr Ala Asn Met Met Leu Lys Val Tyr Gly Arg  
515 520 525

Asn Asp Met Phe Ser Glu Ala Lys Glu Leu Phe Glu Glu Ile Val Ser  
530 535 540

Arg Lys Glu Thr His Leu Val Pro Asn Glu Tyr Thr Tyr Ser Phe Met  
545 550 555 560

Leu Glu Ala Ser Ala Arg Ser Leu Gln Trp Glu Tyr Phe Glu His Val  
565 570 575

Tyr Gln Thr Met Val Leu Ser Gly Tyr Gln Met Asp Gln Thr Lys His  
580 585 590

Ala Ser Met Leu Ile Glu Ala Ser Arg Ala Gly Lys Trp Ser Leu Leu  
595 600 605

Glu His Ala Phe Asp Ala Val Leu Glu Asp Gly Glu Ile Pro His Pro  
610 615 620

Leu Phe Phe Thr Glu Leu Leu Cys His Ala Thr Ala Lys Gly Asp Phe  
625 630 635 640

Gln Arg Ala Ile Thr Leu Ile Asn Thr Val Ala Leu Ala Ser Phe Gln  
645 650 655

Ile Ser Glu Glu Glu Trp Thr Asp Leu Phe Glu Glu His Gln Asp Trp  
660 665 670

Leu Thr Gln Asp Asn Leu His Lys Leu Ser Asp His Leu Ile Glu Cys  
675 680 685

Asp Tyr Val Ser Glu Pro Thr Val Ser Asn Leu Ser Lys Ser Leu Lys  
690 695 700

Ser Arg Cys Gly Ser Ser Ser Ser Ala Gln Pro Leu Leu Ala Val  
705 710 715 720

Asp Val Thr Thr Gln Ser Gln Gly Glu Lys Pro Glu Glu Asp Leu Leu  
725 730 735

Leu Gln Asp Thr Thr Met Glu Asp Asp Asn Ser Ala Asn Gly Glu Ala  
740 745 750

Trp Glu Phe Thr Glu Thr Glu Leu Glu Thr Leu Gly Leu Glu Glu Leu  
Page 74

755

760

765

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&lt;222&gt; (1)..(2511)

&lt;223&gt;

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acg ctt agt agg agt tcc att tct gag tct cca ttg att tct ccg agt 96  
 Thr Leu Ser Arg Ser Ser Ile Ser Glu Ser Pro Leu Ile Ser Pro Ser  
 20 25 30

cga ata aac cct aaa tta gcc ggt agt ttc tcg ttc aac atc cga tta 144  
 Arg Ile Asn Pro Lys Leu Ala Gly Ser Phe Ser Phe Asn Ile Arg Leu  
 35 40 45

ttg agc tat ttc act gtt aga aat ggc ttt tgt ccc gat tgt tct gta 192  
 Leu Ser Tyr Phe Thr Val Arg Asn Gly Phe Cys Pro Asp Cys Ser Val  
 50 55 60

ccg aga gac cct aat ttt gtt gga ttg act aca caa tgt cgg agt att 240  
 Pro Arg Asp Pro Asn Phe Val Gly Leu Thr Thr Gln Cys Arg Ser Ile  
 65 70 75 80

gtc agg agg ttt tgt agt gaa aag att gga agt agt gaa tct agt ggc 288  
 Val Arg Arg Phe Cys Ser Glu Lys Ile Gly Ser Ser Glu Ser Ser Gly  
 85 90 95

tgg aca gag gag gtt gag tat tta gat gag tcg ggt agt gta cta cac 336  
 Trp Thr Glu Glu Val Glu Tyr Leu Asp Glu Ser Gly Ser Val Leu His  
 100 105 110

agt ggt aag gga ata aga tca gta gag ccg ggg ctt gat gac cat gta 384  
 Ser Gly Lys Gly Ile Arg Ser Val Glu Pro Gly Leu Asp Asp His Val  
 115 120 125

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	130					135					140					
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145					150				155						160	
act Thr	cag Gln	tta Leu	gat Asp	aaa Lys	ctc Leu	cag Gln	ttt Phe	ggt Val	ccg Pro	aat Asn	atg Met	ggt Val	cat His	att Ile	acg Thr	528
				165					170					175		
cag Gln	tct Ser	ttg Leu	aag Lys	att Ile	ggt Val	aaa Lys	gag Glu	ggt Val	gat Asp	gcg Ala	gcg Ala	ctg Leu	agt Ser	ctg Leu	ttt Phe	576
			180					185					190			
agg Arg	tgg Trp	gct Ala	aag Lys	aag Lys	cag Gln	cct Pro	tgg Trp	tat Tyr	ctg Leu	cct Pro	tcg Ser	gat Asp	gaa Glu	tgt Cys	tat Tyr	624
		195					200					205				
gtc Val	gtg Val	ttg Leu	ttt Phe	gat Asp	ggg Gly	ttg Leu	aac Asn	cag Gln	gga Gly	agg Arg	gat Asp	ttt Phe	ggt Val	ggg Gly	att Ile	672
	210					215					220					
cag Gln	tcg Ser	ttg Leu	ttt Phe	gag Glu	gag Glu	atg Met	ggt Val	caa Gln	gac Asp	tcg Ser	agt Ser	agt Ser	cac His	ggg Gly	gat Asp	720
225					230					235					240	
ttg Leu	tcg Ser	ttt Phe	aac Asn	gcc Ala	tat Tyr	aac Asn	caa Gln	gtg Val	att Ile	cag Gln	tat Tyr	ttg Leu	gct Ala	aaa Lys	gct Ala	768
				245					250					255		
gag Glu	aaa Lys	ctg Leu	gag Glu	ggt Val	gct Ala	ttt Phe	tgt Cys	tgt Cys	ttc Phe	aaa Lys	aag Lys	gct Ala	caa Gln	gag Glu	tcg Ser	816
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gga Gly	tgc Cys	aaa Lys	att Ile	gat Asp	acg Thr	cag Gln	aca Thr	tat Tyr	aat Asn	aat Asn	cta Leu	atg Met	atg Met	ttg Leu	ttt Phe	864
		275					280					285				
ctg Leu	aac Asn	aaa Lys	ggt Gly	ctc Leu	ccg Pro	tat Tyr	aag Lys	gca Ala	ttt Phe	gag Glu	att Ile	tat Tyr	gag Glu	agc Ser	atg Met	912
	290					295					300					
gag Glu	aaa Lys	act Thr	gat Asp	agt Ser	ttg Leu	ttg Leu	gat Asp	ggg Gly	tca Ser	act Thr	tat Tyr	gag Glu	ctg Leu	ata Ile	att Ile	960
305					310				315						320	
cca Pro	agc Ser	ttg Leu	gcc Ala	aaa Lys	tcc Ser	ggc Gly	cgt Arg	ctt Leu	gat Asp	gca Ala	gct Ala	ttc Phe	aag Lys	ctt Leu	ttt Phe	1008
				325					330					335		
cag Gln	caa Gln	atg Met	aaa Lys	gaa Glu	agg Arg	aaa Lys	ctc Leu	cga Arg	cca Pro	agc Ser	ttt Phe	agt Ser	gtg Val	ttt Phe	tct Ser	1056
			340					345					350			
tcg Ser	ctt Leu	ggt Val	gat Asp	tca Ser	atg Met	ggg Gly	aaa Lys	gct Ala	ggt Gly	cga Arg	ttg Leu	gac Asp	aca Thr	tca Ser	atg Met	1104
		355					360					365				
aag Lys	ggt Val	tac Tyr	atg Met	gaa Glu	atg Met	cag Gln	gga Gly	ttt Phe	ggc Gly	cat His	agg Pro	cca Ser	tca Ser	gca Ala	act Thr	1152



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380

370						375											
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Thr	Ala	Leu	Arg	Leu	Trp	Asp	Glu	Met	Lys	Lys	Ser	Gly	Phe	Arg	Pro		
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aac	ttt	gga	ttg	tac	aca	atg	atc	att	gaa	tct	cat	gca	aaa	tca	gga		1296
Asn	Phe	Gly	Leu	Tyr	Thr	Met	Ile	Ile	Glu	Ser	His	Ala	Lys	Ser	Gly		
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Lys	Leu	Glu	Val	Ala	Met	Thr	Val	Phe	Lys	Asp	Met	Glu	Lys	Ala	Gly		
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ttt	tta	ccg	aca	cca	tcc	aca	tat	tcg	tgt	cta	ttg	gag	atg	cat	gct		1392
Phe	Leu	Pro	Thr	Pro	Ser	Thr	Tyr	Ser	Cys	Leu	Leu	Glu	Met	His	Ala		
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gga	tct	ggg	caa	gta	gac	tct	gca	atg	aaa	atc	tat	aac	tcc	atg	act		1440
Gly	Ser	Gly	Gln	Val	Asp	Ser	Ala	Met	Lys	Ile	Tyr	Asn	Ser	Met	Thr		
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aat	gct	ggg	tta	agg	cct	ggc	ctg	agc	agt	tat	att	tct	ctt	ctt	aca		1488
Asn	Ala	Gly	Leu	Arg	Pro	Gly	Leu	Ser	Ser	Tyr	Ile	Ser	Leu	Leu	Thr		
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ctt	ctg	gcc	aac	aaa	aga	ctt	gtc	gat	gtt	gct	ggg	aag	ata	cta	ctc		1536
Leu	Leu	Ala	Asn	Lys	Arg	Leu	Val	Asp	Val	Ala	Gly	Lys	Ile	Leu	Leu		
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gag	atg	aaa	gca	atg	ggg	tat	tcc	gta	gat	gtc	tgc	gct	agc	gat	gtt		1584
Glu	Met	Lys	Ala	Met	Gly	Tyr	Ser	Val	Asp	Val	Cys	Ala	Ser	Asp	Val		
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Leu	Met	Ile	Tyr	Ile	Lys	Asp	Ala	Ser	Val	Asp	Leu	Ala	Leu	Lys	Trp		
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agg	cct	ttg	ctg	gag	aca	ctc	gtg	cat	tct	gct	gga	aaa	gtt	gac	ttg		1776
Arg	Pro	Leu	Leu	Glu	Thr	Leu	Val	His	Ser	Ala	Gly	Lys	Val	Asp	Leu		
			580					585					590				
gtg	ctt	tac	act	tcg	att	ctc	gcc	cat	ctt	gtc	aga	tgc	caa	gac	gaa		1824
Val	Leu	Tyr	Thr	Ser	Ile	Leu	Ala	His	Leu	Val	Arg	Cys	Gln	Asp	Glu		
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gat	aaa	gag	aga	caa	ttg	atg	tca	atc	ctc	agc	gct	acc	aag	cat	aaa		1872
Asp	Lys	Glu	Arg	Gln	Leu	Met	Ser	Ile	Leu	Ser	Ala	Thr	Lys	His	Lys		
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gaa Glu	ctc Leu	gaa Glu	gaa Glu 660	gga Gly	gct Ala	gct Ala	agg Arg	tac Tyr 665	ttt Phe	gtg Val	aat Asn	gtc Val	ctt Leu 670	ctc Leu	aac Asn	2016
tac Tyr	ctt Leu	gtc Val 675	ttg Leu	atg Met	ggg Gly	caa Gln	ata Ile 680	aac Asn	cga Arg	gct Ala	cga Arg	tgt Cys 685	gtc Val	tgg Trp	aaa Lys	2064
gta Val	gcg Ala 690	tac Tyr	gag Glu	aac Asn	aaa Lys	ctc Leu 695	ttt Phe	cca Pro	aaa Lys	gcc Ala 700	atc Ile	gtc Val	ttt Phe	gat Asp	caa Gln	2112
cac His 705	att Ile	gct Ala	tgg Trp	tct Ser	ctc Leu 710	gat Asp	gtg Val	aga Arg	aac Asn	tta Leu 715	tct Ser	gtc Val	gga Gly	gct Ala	gcg Ala 720	2160
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tac Tyr	tac Tyr	gga Gly	gta Val 740	gtc Val	ccg Pro	aga Arg	cgt Arg	ata Ile 745	aag Lys	cta Leu	gtc Val	aca Thr	gga Gly 750	ccg Pro	aca Thr	2256
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gaa Glu 770	gtc Val	agc Ser	aaa Lys	gtc Val	gtc Val	ttg Leu 775	agg Arg	gca Ala	cca Pro	gga Gly	gag Glu 780	ttg Leu	gtg Val	atg Met	gag Glu	2352
ttg Trp 785	ttc Phe	aag Lys	aaa Lys	ccg Pro	atc Ile 790	gtg Val	caa Gln	cag Gln	ttt Phe	ctt Leu 795	ctg Leu	aac Asn	gag Glu	atc Ile	cca Pro 800	2400
tca Ser	cgg Arg	tct Ser	gat Asp	ata Ile 805	ttg Leu	atg Met	cat His	aag Lys	atg Met 810	aac Asn	gtg Val	atg Met	ttc Phe	cca Pro 815	agc Ser	2448
tcg Ser	gct Ala	cct Pro	gag Glu 820	ctt Leu	aga Arg	tct Ser	atg Met	tca Ser 825	cct Pro	ccc Pro	aaa Lys	cca Pro	ctc Leu 830	atg Met	tca Ser	2496
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&lt;211&gt; 836

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

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Leu Ser Tyr Phe Thr Val Arg Asn Gly Phe Cys Pro Asp Cys Ser Val  
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Pro Arg Asp Pro Asn Phe Val Gly Leu Thr Thr Gln Cys Arg Ser Ile  
 65 70 75 80

Val Arg Arg Phe Cys Ser Glu Lys Ile Gly Ser Ser Glu Ser Ser Gly  
 85 90 95

Trp Thr Glu Glu Val Glu Tyr Leu Asp Glu Ser Gly Ser Val Leu His  
 100 105 110

Ser Gly Lys Gly Ile Arg Ser Val Glu Pro Gly Leu Asp Asp His Val  
 115 120 125

Met Val Gly Gly Leu Lys Lys Pro Tyr Met Asn Ala Ser Ser Val Ala  
 130 135 140

Lys Ile Val Glu Val Val Gln Arg Trp Lys Trp Gly Pro Glu Leu Glu  
 145 150 155 160

Thr Gln Leu Asp Lys Leu Gln Phe Val Pro Asn Met Val His Ile Thr  
 165 170 175

Gln Ser Leu Lys Ile Val Lys Glu Val Asp Ala Ala Leu Ser Leu Phe  
 180 185 190

Arg Trp Ala Lys Lys Gln Pro Trp Tyr Leu Pro Ser Asp Glu Cys Tyr  
 195 200 205

Val Val Leu Phe Asp Gly Leu Asn Gln Gly Arg Asp Phe Val Gly Ile  
 210 215 220

Gln Ser Leu Phe Glu Glu Met Val Gln Asp Ser Ser Ser His Gly Asp  
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Leu Ser Phe Asn Ala Tyr Asn Gln Val Ile Gln Tyr Leu Ala Lys Ala  
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Glu Lys Leu Glu Val Ala Phe Cys Cys Phe Lys Lys Ala Gln Glu Ser  
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Gly Cys Lys Ile Asp Thr Gln Thr Tyr Asn Asn Leu Met Met Leu Phe  
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Leu Asn Lys Gly Leu Pro Tyr Lys Ala Phe Glu Ile Tyr Glu Ser Met  
                   290                  295                  300

Glu Lys Thr Asp Ser Leu Leu Asp Gly Ser Thr Tyr Glu Leu Ile Ile  
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Pro Ser Leu Ala Lys Ser Gly Arg Leu Asp Ala Ala Phe Lys Leu Phe  
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Gln Gln Met Lys Glu Arg Lys Leu Arg Pro Ser Phe Ser Val Phe Ser  
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Ser Leu Val Asp Ser Met Gly Lys Ala Gly Arg Leu Asp Thr Ser Met  
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Lys Val Tyr Met Glu Met Gln Gly Phe Gly His Arg Pro Ser Ala Thr  
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Met Phe Val Ser Leu Ile Asp Ser Tyr Ala Lys Ala Gly Lys Leu Asp  
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Thr Ala Leu Arg Leu Trp Asp Glu Met Lys Lys Ser Gly Phe Arg Pro  
                   405                  410                  415

Asn Phe Gly Leu Tyr Thr Met Ile Ile Glu Ser His Ala Lys Ser Gly  
                   420                  425                  430

Lys Leu Glu Val Ala Met Thr Val Phe Lys Asp Met Glu Lys Ala Gly  
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Phe Leu Pro Thr Pro Ser Thr Tyr Ser Cys Leu Leu Glu Met His Ala  
                   450                  455                  460

Gly Ser Gly Gln Val Asp Ser Ala Met Lys Ile Tyr Asn Ser Met Thr  
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Asn Ala Gly Leu Arg Pro Gly Leu Ser Ser Tyr Ile Ser Leu Leu Thr  
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485

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490

495

Leu Leu Ala Asn Lys Arg Leu Val Asp Val Ala Gly Lys Ile Leu Leu  
500 505 510

Glu Met Lys Ala Met Gly Tyr Ser Val Asp Val Cys Ala Ser Asp Val  
515 520 525

Leu Met Ile Tyr Ile Lys Asp Ala Ser Val Asp Leu Ala Leu Lys Trp  
530 535 540

Leu Arg Phe Met Gly Ser Ser Gly Ile Lys Thr Asn Asn Phe Ile Ile  
545 550 555 560

Arg Gln Leu Phe Glu Ser Cys Met Lys Asn Gly Leu Tyr Asp Ser Ala  
565 570 575

Arg Pro Leu Leu Glu Thr Leu Val His Ser Ala Gly Lys Val Asp Leu  
580 585 590

Val Leu Tyr Thr Ser Ile Leu Ala His Leu Val Arg Cys Gln Asp Glu  
595 600 605

Asp Lys Glu Arg Gln Leu Met Ser Ile Leu Ser Ala Thr Lys His Lys  
610 615 620

Ala His Ala Phe Met Cys Gly Leu Phe Thr Gly Pro Glu Gln Arg Lys  
625 630 635 640

Gln Pro Val Leu Thr Phe Val Arg Glu Phe Tyr Gln Gly Ile Asp Tyr  
645 650 655

Glu Leu Glu Glu Gly Ala Ala Arg Tyr Phe Val Asn Val Leu Leu Asn  
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Tyr Leu Val Leu Met Gly Gln Ile Asn Arg Ala Arg Cys Val Trp Lys  
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Val Ala Tyr Glu Asn Lys Leu Phe Pro Lys Ala Ile Val Phe Asp Gln  
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His Ile Ala Trp Ser Leu Asp Val Arg Asn Leu Ser Val Gly Ala Ala  
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Leu Ile Ala Val Val His Thr Leu His Arg Phe Arg Lys Arg Met Leu  
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Tyr Tyr Gly Val Val Pro Arg Arg Ile Lys Leu Val Thr Gly Pro Thr  
 740 745 750

Leu Lys Ile Val Ile Ala Gln Met Leu Ser Ser Val Glu Ser Pro Phe  
 755 760 765

Glu Val Ser Lys Val Val Leu Arg Ala Pro Gly Glu Leu Val Met Glu  
 770 775 780

Trp Phe Lys Lys Pro Ile Val Gln Gln Phe Leu Leu Asn Glu Ile Pro  
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Ser Arg Ser Asp Ile Leu Met His Lys Met Asn Val Met Phe Pro Ser  
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Gln	Ser	Pro	Leu	Lys	Gln	Pro	Phe	Ser	Cys	Leu	Pro	Phe	Arg	Trp	Arg	
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aca Thr	tcg Ser	att Ile	gaa Glu
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cgg Arg	aca Thr	cca Pro	gac Asp
gat Asp	ggt Val	gat Asp	act Thr
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tat Tyr	cca Pro	agt Ser	gga Gly
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gca Ala	act Thr	gat Asp	att Ile
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aaa Lys	tgg Trp	aca Thr	caa Gln
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gaa Glu	gaa Glu	gtg Val	gtg Val
gat Asp			
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aag Lys	ccg Pro	atg Met	agg Arg
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cca Pro	gat Asp	aca Thr	ctt Leu 340	ttt Phe	gga Gly	gca Ala	act Thr	tac Tyr 345	atg Met	gtt Val	gtg Val	gca Ala	cca Pro 350	gag Glu	cat His	1056
cag Gln	ttg Leu 355	ttg Leu	tct Ser	tac Tyr	ttt Phe	gta Val	acc Thr 360	gca Ala	gaa Glu	cag Gln	aaa Lys	cag Gln 365	caa Gln	gtt Val	gag Glu	1104
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cca Pro	gct Ala	aat Asn	gga Gly	gat Asp 405	gct Ala	att Ile	ccc Pro	ata Ile	tgg Trp 410	gta Val	gct Ala	gat Asp	tat Tyr	gtt Val 415	cta Leu	1248
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tta Leu	att Ile 530	ttg Leu	gat Asp	gag Glu	tct Ser	ggt Gly 535	gaa Glu	act Thr	att Ile	gct Ala 540	att Ile	tca Ser	gaa Glu	tct Ser	gaa Glu	1632
ctg Leu 545	ccc Pro	ctc Leu	act Thr	ttg Leu	cct Pro 550	gag Glu	tta Leu	aat Asn	gat Asp	ttt Phe 555	acg Thr	ccc Pro	act Thr	gga Gly	aca Thr 560	1680



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cct Pro	tca Ser	aca Thr	gga Gly 580	aaa Lys	cct Pro	gcc Ala	aaa Lys	aga Arg 585	gaa Glu	aca Thr	agc Ser	act Thr	atg Met 590	cca Pro	caa Gln	1776
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gat Asp	act Thr 690	gaa Glu	gaa Glu	cgg Arg	tta Leu	aat Asn 695	gaa Glu	cat His	caa Gln	caa Gln	gtg Val 700	aca Thr	atc Ile	ccg Pro	gaa Glu	2112
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aat Asn	gtc Val	gta Val	aat Asn 740	cct Pro	gat Asp	gat Asp	gtt Val	gta Val 745	tta Leu	gag Glu	tat Tyr	ggt Gly	gca Ala 750	gat Asp	tct Ser	2256
cta Leu	cgt Arg	ttg Leu 755	tat Tyr	gag Glu	atg Met	ttc Phe	atg Met 760	gga Gly	cca Pro	ttt Phe	agg Arg	gac Asp 765	tca Ser	aaa Lys	act Thr	2304
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gga Gly	acc Thr	tta Leu	gta Val	act Thr 805	gat Asp	gac Asp	gaa Glu	cca Pro	acc Thr 810	ctt Leu	gaa Glu	caa Gln	ctc Leu	cga Arg 815	act Thr	2448

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 Phe Asn Thr Gly Ile Ser Gly Met Met Glu Phe Val Asn Ala Ala Tyr  
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 885 890 895  
 gat tac tta aag aac aca act att gtt ctt cca gtt cag ata aac ggc 2736  
 Asp Tyr Leu Lys Asn Thr Thr Ile Val Leu Pro Val Gln Ile Asn Gly  
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 aag aca aga ggc acc ata gag gtt gaa gaa gga tgc tct gaa gat gat 2784  
 Lys Thr Arg Gly Thr Ile Glu Val Glu Glu Gly Cys Ser Glu Asp Asp  
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 Ala Phe Val Leu Ala Ser Gln Asp Asp Lys Leu Arg Lys Tyr Leu Asp  
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Gln Ser Pro Leu Lys Gln Pro Phe Ser Cys Leu Pro Phe Arg Trp Arg  
 Page 86

35

40

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Ser Lys Lys Glu Ala Leu Val Ser Glu Thr Ala Thr Thr Ser Ile Glu  
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Leu Lys Arg Val Tyr Pro Phe His Glu Ile Glu Pro Lys Trp Gln Arg  
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Tyr Trp Glu Asp Asn Arg Ile Phe Arg Thr Pro Asp Asp Val Asp Thr  
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Ser Lys Pro Lys Phe Tyr Val Leu Asp Met Phe Pro Tyr Pro Ser Gly  
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Ala Gly Leu His Val Gly His Pro Leu Gly Tyr Thr Ala Thr Asp Ile  
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Leu Ala Arg Leu Arg Arg Met Gln Gly Tyr Asn Val Leu His Pro Met  
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Gly Trp Asp Ala Phe Gly Leu Pro Ala Glu Gln Tyr Ala Ile Glu Thr  
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Gly Thr His Pro Lys Thr Thr Thr Leu Lys Asn Ile Asp Arg Phe Arg  
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Ser Thr Thr Glu Pro Asp Tyr Tyr Lys Trp Thr Gln Trp Ile Phe Leu  
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Gln Leu Tyr Lys Lys Gly Leu Ala Tyr Gln Ala Glu Val Pro Val Asn  
 225 230 235 240

Trp Cys Pro Ala Leu Gly Thr Val Leu Ala Asn Glu Glu Val Val Asp  
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Gly Val Ser Glu Arg Gly Gly His Pro Val Ile Arg Lys Pro Met Arg  
 260 265 270

Gln Trp Met Leu Lys Ile Thr Ala Tyr Ala Asp Arg Leu Leu Glu Asp  
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Trp Ile Gly Arg Ser Glu Gly Ala Glu Leu Asn Phe Ser Ile Leu Asp  
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Gly Glu Gly Arg Glu Thr Asp Lys Glu Ile Thr Val Tyr Thr Thr Arg  
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Pro Asp Thr Leu Phe Gly Ala Thr Tyr Met Val Val Ala Pro Glu His  
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Gln Leu Leu Ser Tyr Phe Val Thr Ala Glu Gln Lys Gln Gln Val Glu  
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Glu Tyr Lys Asp Phe Ala Ser Arg Lys Ser Asp Leu Glu Arg Thr Glu  
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Leu Gln Lys Asp Lys Thr Gly Val Phe Thr Gly Cys Tyr Ala Lys Asn  
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Pro Ala Asn Gly Asp Ala Ile Pro Ile Trp Val Ala Asp Tyr Val Leu  
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Ala Ser Tyr Gly Thr Gly Ala Ile Met Ala Val Pro Ala His Asp Thr  
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Arg Asp Asn Glu Phe Ala Leu Lys Tyr Asn Ile Pro Ile Lys Trp Val  
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Val Arg Asn Glu Ala Asn Ser Ser Asp Asp Ala Lys Gln Val Tyr Pro  
 450 455 460

Gly Leu Gly Ile Ile Glu Asn Ser Ser Thr Leu Glu Thr Gly Leu Asp  
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Ile Asn Gln Leu Ser Ser Lys Glu Ala Ala Leu Lys Val Ile Glu Trp  
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Ala Glu Arg Thr Gly Asn Gly Lys Lys Lys Val Asn Tyr Lys Leu Arg  
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Asp Trp Leu Phe Ala Arg Gln Arg Tyr Trp Gly Glu Pro Ile Pro Ile  
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Leu Ile Leu Asp Glu Ser Gly Glu Thr Ile Ala Ile Ser Glu Ser Glu  
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Gly Glu Pro Pro Leu Ser Lys Ala Val Ser Trp Val Asn Thr Val Asp  
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Trp Ala Gly Ser Cys Trp Tyr Tyr Leu Arg Phe Met Asp Pro Lys Asn  
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Pro Glu Ala Leu Val Asp Lys Glu Lys Glu Lys Tyr Trp Ser Pro Val  
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Asp Val Tyr Val Gly Gly Ala Glu His Ala Val Leu His Leu Leu Tyr  
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Asp Thr Glu Glu Arg Leu Asn Glu His Gln Gln Val Thr Ile Pro Glu  
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Glu Lys Val Ile Lys Ser Gly Asp His Phe Val Leu Lys Glu Asp Pro  
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Ser Ile Arg Leu Ile Pro Arg Val Tyr Lys Met Ser Lys Ser Arg Gly  
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Leu Arg Leu Tyr Glu Met Phe Met Gly Pro Phe Arg Asp Ser Lys Thr  
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Trp Arg Leu Val Ile Gly Leu Pro Gln Ser Asp Gly Ser Phe Lys Asp  
785 790 795 800

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Gly His Pro Asn Ser Leu Ala Tyr Glu Ser Phe Pro Lys Ala Asn Pro  
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Asp Tyr Leu Lys Asn Thr Thr Ile Val Leu Pro Val Gln Ile Asn Gly  
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Lys Thr Arg Gly Thr Ile Glu Val Glu Glu Gly Cys Ser Glu Asp Asp  
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Gly Gln Ser Ile Lys Lys Arg Ile Tyr Val Pro Gly Lys Ile Leu Asn  
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Met	Arg	Val	Thr	Ile	Gln	Asp	Gly	Arg	Gln	Leu	Val	Gly	Lys	Phe	Met		
			20					25					30				
gcg	ttt	gac	cgt	cac	atg	aac	ctc	ggt	ctc	ggc	gat	tgc	gag	gag	ttt		144
Ala	Phe	Asp	Arg	His	Met	Asn	Leu	Val	Leu	Gly	Asp	Cys	Glu	Glu	Phe		
		35					40					45					
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Arg	Lys	Leu	Pro	Pro	Ala	Lys	Gly	Lys	Lys	Ile	Asn	Glu	Glu	Arg	Glu		
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gat	cgc	cgt	acg	cta	ggt	tta	gtg	ttg	ctt	aga	ggt	gaa	gaa	ggt	atc		240
Asp	Arg	Arg	Thr	Leu	Gly	Leu	Val	Leu	Leu	Arg	Gly	Glu	Glu	Val	Ile		
65					70					75					80		
tca	atg	act	gtc	gaa	gga	cca	cct	cct	cct	gaa	gaa	tct	cgt	gct	aaa		288
Ser	Met	Thr	Val	Glu	Gly	Pro	Pro	Pro	Pro	Glu	Glu	Ser	Arg	Ala	Lys		
				85					90					95			
gct	ggc	tct	gca	gct	gct	ggt	gct	ggt	cca	gga	att	ggc	cgt	gcc	gct		336
Ala	Gly	Ser	Ala	Ala	Ala	Val	Ala	Gly	Pro	Gly	Ile	Gly	Arg	Ala	Ala		
			100					105					110				
ggg	cgt	gga	ggt	cct	act	ggt	ccg	tta	ggt	caa	gct	cag	cct	ggt	tta		384
Gly	Arg	Gly	Val	Pro	Thr	Gly	Pro	Leu	Val	Gln	Ala	Gln	Pro	Gly	Leu		
		115					120					125					
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Ser	Gly	Pro	Val	Arg	Gly	Val	Gly	Gly	Pro	Ala	Pro	Gly	Met	Met	Gln		
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Pro	Gln	Ile	Ser	Arg	Pro	Pro	Gln	Leu	Ser	Ala	Pro	Pro	Ile	Ile	Arg		
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cct	ccg	gga	cag	atg	ttg	cca	ccg	cct	cct	ttt	ggt	ggt	caa	ggt	cct		528
Pro	Pro	Gly	Gln	Met	Leu	Pro	Pro	Pro	Pro	Phe	Gly	Gly	Gln	Gly	Pro		
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cct	atg	gga	aga	ggt	cct	cca	ccg	cct	tat	ggt	atg	agg	cca	ccg	cca		576
Pro	Met	Gly	Arg	Gly	Pro	Pro	Pro	Pro	Tyr	Gly	Met	Arg	Pro	Pro	Pro		
			180					185					190				
cag	cag	ttt	tct	gga	cca	cca	ccg	cct	cag	tat	ggg	caa	agg	cca	atg		624
Gln	Gln	Phe	Ser	Gly	Pro	Pro	Pro	Pro	Gln	Tyr	Gly	Gln	Arg	Pro	Met		
		195					200					205					
att	cct	cct	cct	ggt	ggt	atg	atg	aga	gga	cct	cct	cct	cca	cct	cat		672
Ile	Pro	Pro	Pro	Gly	Gly	Met	Met	Arg	Gly	Pro	Pro	Pro	Pro	Pro	His		
	210					215					220						
gga	atg	caa	gga	cct	cct	ccg	cct	cgc	cct	gga	atg	cct	cct	gct	cct		720
Gly	Met	Gln	Gly	Pro	Pro	Pro	Pro	Arg	Pro	Gly	Met	Pro	Pro	Ala	Pro		
225					230					235					240		

70166USNP.ST25

ggt ggt ttt gct cca ccg cgt cct ggc atg cca cca cat aat cag cag 768  
Gly Gly Phe Ala Pro Pro Arg Pro Gly Met Pro Pro His Asn Gln Gln  
245 250 255

cag tga 774  
Gln

**<210> 26**

**<211> 257**

<212> PRT

<213> Arabidopsis thaliana

**<400> 26**

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1 5 10 15

Met Arg Val Thr Ile Gln Asp Gly Arg Gln Leu Val Gly Lys Phe Met  
20 25 30

Ala Phe Asp Arg His Met Asn Leu Val Leu Gly Asp Cys Glu Glu Phe  
35 40 45

Arg Lys Leu Pro Pro Ala Lys Gly Lys Lys Ile Asn Glu Glu Arg Glu  
50 55 60

Asp Arg Arg Thr Leu Gly Leu Val Leu Leu Arg Gly Glu Glu Val Ile  
65 70 75 80

Ser Met Thr Val Glu Gly Pro Pro Pro Pro Glu Glu Ser Arg Ala Lys  
85 90 95

Ala Gly Ser Ala Ala Ala Val Ala Gly Pro Gly Ile Gly Arg Ala Ala  
100 105 110

Gly Arg Gly Val Pro Thr Gly Pro Leu Val Gln Ala Gln Pro Gly Leu  
115 120 125

Ser Gly Pro Val Arg Gly Val Gly Gly Pro Ala Pro Gly Met Met Gln  
130 135 140

Pro Gln Ile Ser Arg Pro Pro Gln Leu Ser Ala Pro Pro Ile Ile Arg  
145 150 155 160

Pro Pro Gly Gln Met Leu Pro Pro Pro Pro Phe Gly Gly Gln Gly Pro  
Page 92



Pro Met Gly Arg Gly Pro Pro Pro Pro Tyr Gly Met Arg Pro Pro Pro  
180 185 190

Gln Gln Phe Ser Gly Pro Pro Pro Pro Gln Tyr Gly Gln Arg Pro Met  
195 200 205

Ile Pro Pro Pro Gly Gly Met Met Arg Gly Pro Pro Pro Pro His  
210 215 220

Gly Met Gln Gly Pro Pro Pro Pro Arg Pro Gly Met Pro Pro Ala Pro  
225 230 235 240

Gly Gly Phe Ala Pro Pro Arg Pro Gly Met Pro Pro His Asn Gln Gln  
245 250 255

Gln

<210> 27

<211> 1311

<212> DNA

<213> Arabidopsis thaliana

<220>

<221> CDS

<222> (1)..(1311)

<223>

<400> 27

atg gcg tcg tct tct ctc act tcg aaa tcc att ctc gga tcc acc aaa 48  
Met Ala Ser Ser Ser Leu Thr Ser Lys Ser Ile Leu Gly Ser Thr Lys  
1 5 10 15

ctc ggt tct tct tct ctt ccc tcg gag ctc cgt cgt ctc tct tct ccc 96  
Leu Gly Ser Ser Ser Leu Pro Ser Glu Leu Arg Arg Leu Ser Ser Pro  
20 25 30

gcc gtt cag atc tct ctc cgt acc caa acc agg aag aac ttc cag ata 144  
Ala Val Gln Ile Ser Leu Arg Thr Gln Thr Arg Lys Asn Phe Gln Ile  
35 40 45

caa gct act gga agt tca tat ggg act cat ttt cga gtt tca act ttt 192  
Gln Ala Thr Gly Ser Ser Tyr Gly Thr His Phe Arg Val Ser Thr Phe  
50 55 60

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gga Gly 65	gaa Glu	tca Ser	cat His	gga Gly 70	gga Gly	gga Gly	gtt Val	ggt Gly	tgt Cys 75	atc Ile	att Ile	gat Asp	ggt Gly	tgt Cys	cct Pro 80	240
cct Pro	cgt Arg	att Ile	cca Pro	ctt Leu 85	act Thr	gaa Glu	tct Ser	gat Asp	ttg Leu 90	caa Gln	ttc Phe	gat Asp	ctc Leu	gat Asp 95	aga Arg	288
agg Arg	agg Arg	cct Pro	ggt Gly 100	cag Gln	agc Ser	agg Arg	atc Ile	aca Thr 105	act Thr	cct Pro	aga Arg	aaa Lys	gag Glu 110	act Thr	gat Asp	336
act Thr	tgc Cys	cgg Arg 115	ata Ile	tcg Ser	tct Ser	gga Gly	gtc Val 120	tct Ser	gaa Glu	gga Gly	atg Met	acg Thr 125	aca Thr	gga Gly	aca Thr	384
cct Pro	atc Ile 130	cat His	gtg Val	ttt Phe	gta Val	cca Pro 135	aac Asn	aca Thr	gat Asp	cag Gln	aga Arg 140	gga Gly	ctt Leu	gat Asp	tac Tyr	432
agt Ser 145	gaa Glu	atg Met	tcg Ser	gtt Val	gcc Ala 150	tat Tyr	aga Arg	cca Pro	tcg Ser	cat His 155	gct Ala	gat Asp	gca Ala	act Thr	tat Tyr 160	480
gac Asp	atg Met	aag Lys	tat Tyr	ggt Gly 165	gtc Val	aga Arg	tca Ser	gtg Val	cag Gln 170	ggt Gly	gga Gly	gga Gly	aga Arg	tct Ser 175	tca Ser	528
gct Ala	aga Arg	gag Glu	acc Thr 180	att Ile	gga Gly	aga Arg	gtt Val	gct Ala 185	cct Pro	gga Gly	gct Ala	ttg Leu	gcc Ala 190	aag Lys	aaa Lys	576
att Ile	ttg Leu	aag Lys 195	caa Gln	ttt Phe	gca Ala	gga Gly	act Thr 200	gag Glu	att Ile	ctt Leu	gcc Ala	tat Tyr 205	gtc Val	tcg Ser	caa Gln	624
gtt Val	cac His 210	cat His	gtt Val	gta Val	ctt Leu	cca Pro 215	gaa Glu	gaa Glu	ttg Leu	gta Val	gac Asp 220	cac His	gag Glu	aat Asn	tta Leu	672
aca Thr 225	ctc Leu	gaa Glu	cag Gln	ata Ile	gaa Glu 230	aat Asn	aac Asn	att Ile	gtc Val	aga Arg 235	tgc Cys	cct Pro	aat Asn	ccc Pro	gag Glu 240	720
tat Tyr	gcg Ala	gaa Glu	aag Lys	atg Met 245	ata Ile	gct Ala	gcg Ala	att Ile	gat Asp 250	gct Ala	gtc Val	agg Arg	aca Thr	aaa Lys 255	ggg Gly	768
aac Asn	tct Ser	gtt Val	ggt Gly 260	ggt Gly	gtt Val	gtg Val	acc Thr	tgc Cys 265	att Ile	gtt Val	cgg Arg	aat Asn	gct Ala 270	cca Pro	cgt Arg	816
ggg Gly	ctt Leu	ggt Gly 275	aca Thr	ccg Pro	gtt Val	ttc Phe	gat Asp 280	aaa Lys	ctt Leu	gaa Glu	gca Ala	gaa Glu 285	ctg Leu	gca Ala	aaa Lys	864
gct Ala	tgt Cys 290	atg Met	tcg Ser	cta Leu	cct Pro	gca Ala 295	act Thr	aag Lys	gga Gly	ttt Phe	gag Glu 300	ttt Phe	gga Gly	agc Ser	ggc Gly	912
ttt Phe	gca Ala	ggt Gly	acc Thr	ttt Phe	ttg Leu	act Thr	ggt Gly	ctt Leu	gaa Glu	cac His	aat Asn	gat Asp	gag Glu	ttc Phe	tat Tyr	960

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305		310		315		320	
acc gat gaa aat gga aga ata cgt acc aga acc aac cga tct ggt gga							1008
Thr Asp Glu Asn Gly Arg Ile Arg Thr Arg Thr Asn Arg Ser Gly Gly							
				325		330	
att cag gga ggg atc tca aat ggt gaa ata ata aac atg aga gta gcc							1056
Ile Gln Gly Gly Ile Ser Asn Gly Glu Ile Ile Asn Met Arg Val Ala							
				340		350	
ttc aag cca aca tca aca att gga agg aag caa aat acg gta acc aga							1104
Phe Lys Pro Thr Ser Thr Ile Gly Arg Lys Gln Asn Thr Val Thr Arg							
				355		365	
gac aag gta gaa acc gaa atg att gcg cgt ggt cgt cat gat cct tgt							1152
Asp Lys Val Glu Thr Glu Met Ile Ala Arg Gly Arg His Asp Pro Cys							
				375		380	
gtt gtt cca cga gct gtg cca atg gtg gaa gca atg gtg gct cta gtt							1200
Val Val Pro Arg Ala Val Pro Met Val Glu Ala Met Val Ala Leu Val							
				385		395	400
ctt gtg gat caa ttg atg gcg caa tac gca caa tgc cat ttg ttt cca							1248
Leu Val Asp Gln Leu Met Ala Gln Tyr Ala Gln Cys His Leu Phe Pro							
				405		410	415
ata aat cca gag ttg cag gaa cct ctc cag ata gag cag ccg caa aat							1296
Ile Asn Pro Glu Leu Gln Glu Pro Leu Gln Ile Glu Gln Pro Gln Asn							
				420		430	
gct act gct ttg taa							1311
Ala Thr Ala Leu							
				435			

&lt;210&gt; 28

&lt;211&gt; 436

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 28

Met	Ala	Ser	Ser	Ser	Leu	Thr	Ser	Lys	Ser	Ile	Leu	Gly	Ser	Thr	Lys
1				5				10						15	

Leu	Gly	Ser	Ser	Ser	Leu	Pro	Ser	Glu	Leu	Arg	Arg	Leu	Ser	Ser	Pro
			20					25					30		

Ala	Val	Gln	Ile	Ser	Leu	Arg	Thr	Gln	Thr	Arg	Lys	Asn	Phe	Gln	Ile
		35					40					45			

Gln	Ala	Thr	Gly	Ser	Ser	Tyr	Gly	Thr	His	Phe	Arg	Val	Ser	Thr	Phe
	50					55					60				

Gly Glu Ser His Gly Gly Gly Val Gly Cys Ile Ile Asp Gly Cys Pro  
 65 70 75 80

Pro Arg Ile Pro Leu Thr Glu Ser Asp Leu Gln Phe Asp Leu Asp Arg  
 85 90 95

Arg Arg Pro Gly Gln Ser Arg Ile Thr Thr Pro Arg Lys Glu Thr Asp  
 100 105 110

Thr Cys Arg Ile Ser Ser Gly Val Ser Glu Gly Met Thr Thr Gly Thr  
 115 120 125

Pro Ile His Val Phe Val Pro Asn Thr Asp Gln Arg Gly Leu Asp Tyr  
 130 135 140

Ser Glu Met Ser Val Ala Tyr Arg Pro Ser His Ala Asp Ala Thr Tyr  
 145 150 155 160

Asp Met Lys Tyr Gly Val Arg Ser Val Gln Gly Gly Gly Arg Ser Ser  
 165 170 175

Ala Arg Glu Thr Ile Gly Arg Val Ala Pro Gly Ala Leu Ala Lys Lys  
 180 185 190

Ile Leu Lys Gln Phe Ala Gly Thr Glu Ile Leu Ala Tyr Val Ser Gln  
 195 200 205

Val His His Val Val Leu Pro Glu Glu Leu Val Asp His Glu Asn Leu  
 210 215 220

Thr Leu Glu Gln Ile Glu Asn Asn Ile Val Arg Cys Pro Asn Pro Glu  
 225 230 235 240

Tyr Ala Glu Lys Met Ile Ala Ala Ile Asp Ala Val Arg Thr Lys Gly  
 245 250 255

Asn Ser Val Gly Gly Val Val Thr Cys Ile Val Arg Asn Ala Pro Arg  
 260 265 270

Gly Leu Gly Thr Pro Val Phe Asp Lys Leu Glu Ala Glu Leu Ala Lys  
 275 280 285

Ala Cys Met Ser Leu Pro Ala Thr Lys Gly Phe Glu Phe Gly Ser Gly  
 290 295 300

Phe Ala Gly Thr Phe Leu Thr Gly Leu Glu His Asn Asp Glu Phe Tyr  
 305 310 315 320

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Thr Asp Glu Asn Gly Arg Ile Arg Thr Arg Thr Asn Arg Ser Gly Gly  
325 330 335

Ile Gln Gly Gly Ile Ser Asn Gly Glu Ile Ile Asn Met Arg Val Ala  
340 345 350

Phe Lys Pro Thr Ser Thr Ile Gly Arg Lys Gln Asn Thr Val Thr Arg  
355 360 365

Asp Lys Val Glu Thr Glu Met Ile Ala Arg Gly Arg His Asp Pro Cys  
370 375 380

Val Val Pro Arg Ala Val Pro Met Val Glu Ala Met Val Ala Leu Val  
385 390 395 400

Leu Val Asp Gln Leu Met Ala Gln Tyr Ala Gln Cys His Leu Phe Pro  
405 410 415

Ile Asn Pro Glu Leu Gln Glu Pro Leu Gln Ile Glu Gln Pro Gln Asn  
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Ala Thr Ala Leu  
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<210> 29

<211> 1038

<212> DNA

<213> Arabidopsis thaliana

<220>

<221> CDS

<222> (1)..(1038)

<223>

<400> 29

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Met	Leu	Ser	Leu	Ser	Cys	Ser	Ser	Ser	Ser	Ser	Ser	Leu	Leu	Pro	Pro	
1				5					10				15			

agt	tta	cac	tac	cac	ggt	tct	tct	tct	ggt	cag	tcc	atc	ggt	gta	cca	96
Ser	Leu	His	Tyr	His	Gly	Ser	Ser	Ser	Val	Gln	Ser	Ile	Val	Val	Pro	
			20					25					30			

aga	agg	agt	ctt	atc	tcg	ttt	cgt	cgg	aaa	gtc	tct	tgc	tgt	tgc	ata	144
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Arg	Arg	Ser 35	Leu	Ile	Ser	Phe	Arg 40	Arg	Lys	Val	Ser 45	Cys	Cys	Cys	Ile	
gct Ala	cca Pro	cct Pro	cag Gln	aac Asn	ttg Leu	gac Asp	aac Asn	gat Asp	gcc Ala	acc Thr	aaa Lys	ttc Phe	gat Asp	agt Ser	ctt Leu	192
acc Thr	aag Lys	tct Ser	gga Gly	gga Gly	ggt Gly	atg Met	tgt Cys	aaa Lys	gag Glu	cga Arg	ggg Gly	ctt Leu	gag Glu	aat Asn	gat Asp	240
tct Ser	gat Asp	gtt Val	ctt Leu	att Ile	gaa Glu	tgt Cys	aga Arg	gat Asp	gtc Val	tat Tyr	aaa Lys	tcg Ser	ttt Phe	ggg Gly	gag Glu	288
aaa Lys	cat His	atc Ile	ttg Leu	aaa Lys	ggt Gly	gtt Val	agc Ser	ttt Phe	aag Lys	att Ile	aga Arg	cat His	ggt Gly	gaa Glu	gct Ala	336
gtt Val	ggg Gly	gtg Val	att Ile	ggt Gly	cct Pro	tct Ser	gga Gly	act Thr	gga Gly	aaa Lys	tca Ser	aca Thr	att Ile	tta Leu	aag Lys	384
att Ile	atg Met	gct Ala	ggt Gly	ctt Leu	ctt Leu	gct Ala	cca Pro	gac Asp	aag Lys	gga Gly	gaa Glu	gtt Val	tat Tyr	ata Ile	cga Arg	432
gga Gly	aaa Lys	aaa Lys	cga Arg	gct Ala	ggt Gly	ttg Leu	ata Ile	agt Ser	gat Asp	gag Glu	gaa Glu	ata Ile	tca Ser	gga Gly	ctt Leu	480
cgt Arg	att Ile	ggc Gly	ctg Leu	gta Val	ttt Phe	cag Gln	agt Ser	gca Ala	gct Ala	ctc Leu	ttt Phe	gat Asp	tca Ser	cta Leu	tca Ser	528
gtt Val	cgt Arg	gaa Glu	aat Asn	gtt Val	ggt Gly	ttt Phe	cta Leu	ctt Leu	tat Tyr	gaa Glu	aga Arg	tca Ser	aaa Lys	atg Met	tcc Ser	576
gag Glu	aat Asn	caa Gln	ata Ile	tct Ser	gag Glu	ctt Leu	gtg Val	aca Thr	caa Gln	acc Thr	ttg Leu	gca Ala	gct Ala	gtt Val	ggt Gly	624
ttg Leu	aag Lys	ggg Gly	gtt Val	gag Glu	aat Asn	cga Arg	tta Leu	cct Pro	tct Ser	gag Glu	cta Leu	tct Ser	ggt Gly	gga Gly	atg Met	672
aag Lys	aaa Lys	agg Arg	gtt Val	gct Ala	tta Leu	gct Ala	cgt Arg	tca Ser	cta Leu	att Ile	ttt Phe	gat Asp	aca Thr	aca Thr	aaa Lys	720
gag Glu	gtc Val	ata Ile	gag Glu	cca Pro	gag Glu	gtg Val	ctt Leu	ttg Leu	tac Tyr	gat Asp	gag Glu	cca Pro	act Thr	gct Ala	gga Gly	768
ctt Leu	gat Asp	cca Pro	att Ile	gca Ala	tca Ser	act Thr	gta Val	gtt Val	gaa Glu	gat Asp	ctt Leu	ata Ile	cgg Arg	tct Ser	gtt Val	816
cac His	atg Met	aca Thr	gac Asp	gaa Glu	gat Asp	gca Ala	gtt Val	gga Gly	aaa Lys	cct Pro	gga Gly	aaa Lys	att Ile	gcg Ala	tct Ser	864

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tat	ctt	gtt	gtt	acc	cat	caa	cat	agc	acc	att	caa	aga	gct	gta	gac	912
Tyr	Leu	Val	Val	Thr	His	Gln	His	Ser	Thr	Ile	Gln	Arg	Ala	Val	Asp	
	290					295					300					
agg	tta	ttg	ttt	ctg	tat	gaa	gga	aag	atc	gtt	tgg	caa	gga	atg	aca	960
Arg	Leu	Leu	Phe	Leu	Tyr	Glu	Gly	Lys	Ile	Val	Trp	Gln	Gly	Met	Thr	
	305				310					315					320	
cat	gaa	ttc	aca	acc	tca	act	aat	cca	ata	gtt	caa	cag	ttt	gct	aca	1008
His	Glu	Phe	Thr	Thr	Ser	Thr	Asn	Pro	Ile	Val	Gln	Gln	Phe	Ala	Thr	
				325					330					335		
ggc	agc	ctc	gat	gga	cca	atc	aga	tac	tag							1038
Gly	Ser	Leu	Asp	Gly	Pro	Ile	Arg	Tyr								
			340					345								

&lt;210&gt; 30

&lt;211&gt; 345

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 30

Met	Leu	Ser	Leu	Ser	Cys	Ser	Ser	Ser	Ser	Ser	Ser	Leu	Leu	Pro	Pro
1				5					10					15	
Ser	Leu	His	Tyr	His	Gly	Ser	Ser	Ser	Val	Gln	Ser	Ile	Val	Val	Pro
			20					25					30		
Arg	Arg	Ser	Leu	Ile	Ser	Phe	Arg	Arg	Lys	Val	Ser	Cys	Cys	Cys	Ile
		35					40					45			
Ala	Pro	Pro	Gln	Asn	Leu	Asp	Asn	Asp	Ala	Thr	Lys	Phe	Asp	Ser	Leu
	50					55					60				
Thr	Lys	Ser	Gly	Gly	Gly	Met	Cys	Lys	Glu	Arg	Gly	Leu	Glu	Asn	Asp
65					70					75				80	
Ser	Asp	Val	Leu	Ile	Glu	Cys	Arg	Asp	Val	Tyr	Lys	Ser	Phe	Gly	Glu
				85					90					95	
Lys	His	Ile	Leu	Lys	Gly	Val	Ser	Phe	Lys	Ile	Arg	His	Gly	Glu	Ala
			100					105					110		
Val	Gly	Val	Ile	Gly	Pro	Ser	Gly	Thr	Gly	Lys	Ser	Thr	Ile	Leu	Lys
		115					120					125			
Ile	Met	Ala	Gly	Leu	Leu	Ala	Pro	Asp	Lys	Gly	Glu	Val	Tyr	Ile	Arg
	130					135					140				

Gly Lys Lys Arg Ala Gly Leu Ile Ser Asp Glu Glu Ile Ser Gly Leu  
 145 150 155 160

Arg Ile Gly Leu Val Phe Gln Ser Ala Ala Leu Phe Asp Ser Leu Ser  
 165 170 175

Val Arg Glu Asn Val Gly Phe Leu Leu Tyr Glu Arg Ser Lys Met Ser  
 180 185 190

Glu Asn Gln Ile Ser Glu Leu Val Thr Gln Thr Leu Ala Ala Val Gly  
 195 200 205

Leu Lys Gly Val Glu Asn Arg Leu Pro Ser Glu Leu Ser Gly Gly Met  
 210 215 220

Lys Lys Arg Val Ala Leu Ala Arg Ser Leu Ile Phe Asp Thr Thr Lys  
 225 230 235 240

Glu Val Ile Glu Pro Glu Val Leu Leu Tyr Asp Glu Pro Thr Ala Gly  
 245 250 255

Leu Asp Pro Ile Ala Ser Thr Val Val Glu Asp Leu Ile Arg Ser Val  
 260 265 270

His Met Thr Asp Glu Asp Ala Val Gly Lys Pro Gly Lys Ile Ala Ser  
 275 280 285

Tyr Leu Val Val Thr His Gln His Ser Thr Ile Gln Arg Ala Val Asp  
 290 295 300

Arg Leu Leu Phe Leu Tyr Glu Gly Lys Ile Val Trp Gln Gly Met Thr  
 305 310 315 320

His Glu Phe Thr Thr Ser Thr Asn Pro Ile Val Gln Gln Phe Ala Thr  
 325 330 335

Gly Ser Leu Asp Gly Pro Ile Arg Tyr  
 340 345

<210> 31

<211> 4035

<212> DNA

<213> Arabidopsis thaliana



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&lt;221&gt; CDS

&lt;222&gt; (1)..(4035)

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&lt;400&gt; 31

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Met	Ala	Ser	Ser	Pro	Gly	Asn	Thr	Asn	Pro	His	Asn	Thr	Pro	Pro	Phe	
1				5					10					15		

gat	ctc	ggt	att	ctc	ttc	aaa	cct	tca	tcc	aat	cct	tat	ccg	cca	ccg	96
Asp	Leu	Gly	Ile	Leu	Phe	Lys	Pro	Ser	Ser	Asn	Pro	Tyr	Pro	Pro	Pro	
			20					25					30			

gcg	gca	tct	tat	cct	ccg	cct	aca	ggt	cct	ttt	ctt	cac	aac	cag	tac	144
Ala	Ala	Ser	Tyr	Pro	Pro	Pro	Thr	Gly	Pro	Phe	Leu	His	Asn	Gln	Tyr	
		35					40					45				

gat	cag	cag	cac	tac	gct	ccg	cct	ggt	atc	tcc	gct	caa	cca	tct	ccg	192
Asp	Gln	Gln	His	Tyr	Ala	Pro	Pro	Gly	Ile	Ser	Ala	Gln	Pro	Ser	Pro	
	50					55					60					

gtg	act	cag	cag	caa	cag	gat	gtg	tct	tcc	tct	tcc	gcc	gcg	act	aac	240
Val	Thr	Gln	Gln	Gln	Gln	Asp	Val	Ser	Ser	Ser	Ser	Ala	Ala	Thr	Asn	
65					70					75					80	

ttg	cat	cct	cag	aga	acg	ctg	tct	tat	ccc	acg	cca	cct	ctc	aat	cta	288
Leu	His	Pro	Gln	Arg	Thr	Leu	Ser	Tyr	Pro	Thr	Pro	Pro	Leu	Asn	Leu	
				85					90					95		

caa	tcc	ccc	cgt	tcc	aat	cac	aat	ccc	ggt	acg	cac	atc	ctc	gct	ctc	336
Gln	Ser	Pro	Arg	Ser	Asn	His	Asn	Pro	Gly	Thr	His	Ile	Leu	Ala	Leu	
			100					105					110			

ctt	aac	aat	acc	aac	aac	gga	gcc	ccc	gtg	gct	aac	caa	gag	ccg	tcg	384
Leu	Asn	Asn	Thr	Asn	Asn	Gly	Ala	Pro	Val	Ala	Asn	Gln	Glu	Pro	Ser	
		115					120					125				

cat	cag	ctc	cca	gta	gtc	aat	cac	aac	gag	atc	gct	cgc	tct	ttt	ccc	432
His	Gln	Leu	Pro	Val	Val	Asn	His	Asn	Glu	Ile	Ala	Arg	Ser	Phe	Pro	
	130					135					140					

ggc	ggt	tca	ggt	cct	att	cgt	gta	ccg	agc	tgt	aaa	ttg	ccc	aag	gga	480
Gly	Gly	Ser	Gly	Pro	Ile	Arg	Val	Pro	Ser	Cys	Lys	Leu	Pro	Lys	Gly	
145					150					155					160	

agg	cga	ttg	att	ggt	gaa	cac	gct	gtg	tac	gat	ggt	gat	gtg	aga	tta	528
Arg	Arg	Leu	Ile	Gly	Glu	His	Ala	Val	Tyr	Asp	Val	Asp	Val	Arg	Leu	
				165					170					175		

caa	ggt	gag	att	cag	ccg	cag	ctg	gag	gtg	act	ccg	att	acc	aaa	tac	576
Gln	Gly	Glu	Ile	Gln	Pro	Gln	Leu	Glu	Val	Thr	Pro	Ile	Thr	Lys	Tyr	
			180					185					190			

ggg	tcg	gat	cct	cag	ctc	gta	gtg	ggt	agg	caa	atc	gcc	gtg	aat	aag	624
Gly	Ser	Asp	Pro	Gln	Leu	Val	Val	Gly	Arg	Gln	Ile	Ala	Val	Asn	Lys	
		195					200					205				

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gtt Val	tac Tyr	att Ile	tgc Cys	tat Tyr	gga Gly	ttg Leu	aaa Lys	gga Gly	gga Gly	aac Asn	att Ile	agg Arg	gtt Val	ctc Leu	aat Asn	672
210					215					220						
atc Ile	aac Asn	aca Thr	gca Ala	ttg Leu	agg Arg	tct Ser	ctg Leu	ttc Phe	cgt Arg	ggc Gly	cat His	tca Ser	cag Gln	aga Arg	gtg Val	720
225					230					235					240	
acg Thr	gat Asp	atg Met	gct Ala	ttc Phe	ttt Phe	gcc Ala	gag Glu	gat Asp	gtt Val	gat Asp	atg Met	ttg Leu	gcc Ala	agt Ser	gtt Val	768
				245					250					255		
agc Ser	cta Leu	gat Asp	gga Gly	aaa Lys	gtt Val	ttt Phe	gtg Val	tgg Trp	aaa Lys	att Ile	tct Ser	gaa Glu	ggg Gly	tct Ser	gag Glu	816
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gga Gly	gag Glu	gat Asp	cag Gln	ccc Pro	caa Gln	ata Ile	act Thr	ggg Gly	aag Lys	ata Ile	gta Val	ctt Leu	gct Ala	ctt Leu	cag Gln	864
		275					280					285				
ata Ile	cta Leu	gga Gly	gag Glu	gaa Glu	gac Asp	acc Thr	aaa Lys	cat His	cca Pro	cgc Arg	gtt Val	tgt Cys	tgg Trp	cac His	tgc Cys	912
	290					295					300					
cac His	aaa Lys	cag Gln	gaa Glu	att Ile	ttg Leu	gta Val	gtt Val	tca Ser	att Ile	ggt Gly	aaa Lys	cat His	gta Val	ctg Leu	cgt Arg	960
305					310					315					320	
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	370					375					380					
caa Gln	gat Asp	cgt Arg	aag Lys	gca Ala	caa Gln	cca Pro	ctt Leu	gta Val	gtt Val	ttg Leu	agg Arg	cct Pro	cat His	gat Asp	gga Gly	1200
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				405					410					415		
cac His	atc Ile	ata Ile	ctt Leu	atc Ile	acg Thr	ggg Gly	ggt Gly	cct Pro	cta Leu	aat Asn	cga Arg	gaa Glu	atg Met	aaa Lys	atc Ile	1296
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tgg Trp	gtc Val	tct Ser	gct Ala	ggg Gly	gaa Glu	gaa Glu	ggg Gly	tgg Trp	ctt Leu	tta Leu	cca Pro	gct Ala	gat Asp	gct Ala	gaa Glu	1344
		435					440					445				
tca Ser	tgg Trp	agg Arg	tgt Cys	acc Thr	cag Gln	act Thr	ctt Leu	gac Asp	ttg Leu	aaa Lys	agt Ser	tca Ser	acc Thr	gag Glu	cca Pro	1392

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gat cct cca gaa gaa ccc att gtt aag gtt tat tgt gtt cag act cta Asp Pro Pro Glu Glu Pro Ile Val Lys Val Tyr Cys Val Gln Thr Leu 530 535 540			1632
gca atc cag cag tat aca tta gac ttg tgc tta tgc ttg cca cca cct Ala Ile Gln Gln Tyr Thr Leu Asp Leu Cys Leu Cys Leu Pro Pro Pro 545 550 555 560			1680
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gac tta cct tca gtt gat tca gtg cca aaa cct tcg att ata gtg aat Asp Leu Pro Ser Val Asp Ser Val Pro Lys Pro Ser Ile Ile Val Asn 595 600 605			1824
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cct gta gag gcg att gag cca gta ata cct cat cat gag ctt ggt ggc Pro Val Glu Ala Ile Glu Pro Val Ile Pro His His Glu Leu Gly Gly 675 680 685			2064
aaa aca cct tct gct gat tac tct gtt gat agg caa atg gat gct gtt Lys Thr Pro Ser Ala Asp Tyr Ser Val Asp Arg Gln Met Asp Ala Val 690 695 700			2112
gga gaa aga aat ttg gac gtg tca tcc gta gaa gaa atc tca aga agc 705 710 715			2160

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Gly 705	Glu	Arg	Asn	Leu	Asp 710	Val	Ser	Ser	Val	Glu 715	Glu	Ile	Ser	Arg	Ser 720	
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cca Pro	tca Ser	gct Ala	ttt Phe 740	ttc Phe	aaa Lys	cac His	ccc Pro	act Thr 745	cat His	ctt Leu	gta Val	act Thr	cct Pro 750	tca Ser	gag Glu	2256
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gac Asp 785	acc Thr	gaa Glu	gta Val	gag Glu	gtg Val 790	aaa Lys	gaa Glu	ata Ile	agt Ser	gaa Glu 795	gca Ala	agg Arg	tca Ser	aca Thr	cag Gln 800	2400
aat Asn	ggt Gly	gaa Glu	atc Ile	aat Asn 805	gat Asp	cat His	gac Asp	gaa Glu	act Thr 810	gag Glu	aat Asn	tgc Cys	act Thr	tca Ser 815	gaa Glu	2448
aat Asn	aga Arg	gaa Glu	aaa Lys 820	gtc Val	ttc Phe	tgc Cys	tca Ser	cag Gln 825	gtt Val	tca Ser	aat Asn	ctc Leu	agc Ser 830	act Thr	gag Glu	2496
atg Met	gca Ala	aga Arg 835	gac Asp	tgt Cys	tat Tyr	cct Pro	agt Ser 840	act Thr	gag Glu	gga Gly	act Thr	ttc Phe 845	att Ile	cca Pro	ggg Gly	2544
gaa Glu 850	tct Ser	aag Lys	gca Ala	tat Tyr	gga Gly	caa Gln 855	cct Pro	ata Ile	aag Lys	gct Ala	gga Gly 860	gat Asp	gaa Glu	agt Ser	ggt Gly	2592
gtt Val 865	gac Asp	tcg Ser	aga Arg	ggt Gly	ggg Gly 870	cct Pro	gca Ala	aag Lys	ctt Leu 875	ctt Leu	aaa Lys	gga Gly	aag Lys	aag Lys	cag Gln 880	2640
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cat His	ccc Pro	atg Met 915	aca Thr	gat Asp	tta Leu	ctt Leu	cct Pro 920	cag Gln	ttg Leu	tta Leu	gca Ala	atg Met 925	caa Gln	gaa Glu	acg Thr	2784
atg Met 930	aat Asn	cag Gln	gtg Val	atg Met	gct Ala	tcg Ser 935	cag Gln	aag Lys	gag Glu	atg Met	cag Gln 940	aga Arg	caa Gln	cta Leu	tca Ser	2832
aat Asn 945	gct Ala	gcc Ala	act Thr	ggc Gly	cct Pro 950	atc Ile	gga Gly	aaa Lys	gaa Glu	agt Ser 955	aaa Lys	aga Arg	cta Leu	gaa Glu	gtt Val 960	2880

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cgt gac cat gcc cag caa att gtg aat gca acg aca aac ttc atg agc Arg Asp His Ala Gln Gln Ile Val Asn Ala Thr Thr Asn Phe Met Ser 995 1000 1005	3024
aag gag tta aat gcc atg ttt gag aaa acg ata aag aaa gaa ttg Lys Glu Leu Asn Ala Met Phe Glu Lys Thr Ile Lys Lys Glu Leu 1010 1015 1020	3069
gct gca att ggt cca gcc cta gca cgt tca gta gta cca gtt att Ala Ala Ile Gly Pro Ala Leu Ala Arg Ser Val Val Pro Val Ile 1025 1030 1035	3114
gaa aaa act gta tct tct gca atc aca gag tcc ttt cag aga gga Glu Lys Thr Val Ser Ser Ala Ile Thr Glu Ser Phe Gln Arg Gly 1040 1045 1050	3159
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gct cat act cta aag gaa tca att act tct gcg tcg tca gtt gct Ala His Thr Leu Lys Glu Ser Ile Thr Ser Ala Ser Ser Val Ala 1145 1150 1155	3474
caa gcc tta agt cgt gag tta gcc gag acc caa agg aat ctc tta Gln Ala Leu Ser Arg Glu Leu Ala Glu Thr Gln Arg Asn Leu Leu 1160 1165 1170	3519
gct ctc gca gct gct gga gca aat tct ggt ggg tct aat tcc ttg Ala Leu Ala Ala Ala Gly Ala Asn Ser Gly Gly Ser Asn Ser Leu 1175 1180 1185	3564
gtt act caa cta agt ggc gga cct ttg ggt gct ctt ctt gaa aag Val Thr Gln Leu Ser Gly Gly Pro Leu Gly Ala Leu Leu Glu Lys 1190 1195 1200	3609

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gtt gaa gca cct atg gac cca aca aca gaa cta tcg agg ttg ata	3654
Val Glu Ala Pro Met Asp Pro Thr Thr Glu Leu Ser Arg Leu Ile	
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tct gaa cgg aag tac gaa gaa tct ttc act tcg gcc cta cag aga	3699
Ser Glu Arg Lys Tyr Glu Glu Ser Phe Thr Ser Ala Leu Gln Arg	
1220 1225 1230	
agc gat gtc tct ata gta tca tgg ctt tgc tca cag gtg gat cta	3744
Ser Asp Val Ser Ile Val Ser Trp Leu Cys Ser Gln Val Asp Leu	
1235 1240 1245	
cgt gga tta ctg gcg atg aat ccg ctt cca ctg agc caa ggc gtg	3789
Arg Gly Leu Leu Ala Met Asn Pro Leu Pro Leu Ser Gln Gly Val	
1250 1255 1260	
ctt ctt tca ctg ctg cag cag cta gcc tgt gac att agc aag gac	3834
Leu Leu Ser Leu Leu Gln Gln Leu Ala Cys Asp Ile Ser Lys Asp	
1265 1270 1275	
aca tcc cgt aag ctg gct tgg atg act gat gtg gtt gca gcc ata	3879
Thr Ser Arg Lys Leu Ala Trp Met Thr Asp Val Val Ala Ala Ile	
1280 1285 1290	
aac cca tca gac cag atg att gcg gtc cac gct cgg cca atc ttt	3924
Asn Pro Ser Asp Gln Met Ile Ala Val His Ala Arg Pro Ile Phe	
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Glu Gln Val Tyr Gln Ile Leu His His His Arg Asn Ala Pro Gly	
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Ser Asp Val Ser Ala Ile Arg Leu Ile Met His Val Ile Asn Ser	
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Asp Leu Gly Ile Leu Phe Lys Pro Ser Ser Asn Pro Tyr Pro Pro Pro  
 20 25 30

Ala Ala Ser Tyr Pro Pro Pro Thr Gly Pro Phe Leu His Asn Gln Tyr  
 Page 106

35

40

45

Asp Gln Gln His Tyr Ala Pro Pro Gly Ile Ser Ala Gln Pro Ser Pro  
50 55 60

Val Thr Gln Gln Gln Gln Asp Val Ser Ser Ser Ser Ala Ala Thr Asn  
65 70 75 80

Leu His Pro Gln Arg Thr Leu Ser Tyr Pro Thr Pro Pro Leu Asn Leu  
85 90 95

Gln Ser Pro Arg Ser Asn His Asn Pro Gly Thr His Ile Leu Ala Leu  
100 105 110

Leu Asn Asn Thr Asn Asn Gly Ala Pro Val Ala Asn Gln Glu Pro Ser  
115 120 125

His Gln Leu Pro Val Val Asn His Asn Glu Ile Ala Arg Ser Phe Pro  
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Gly Gly Ser Gly Pro Ile Arg Val Pro Ser Cys Lys Leu Pro Lys Gly  
145 150 155 160

Arg Arg Leu Ile Gly Glu His Ala Val Tyr Asp Val Asp Val Arg Leu  
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Gln Gly Glu Ile Gln Pro Gln Leu Glu Val Thr Pro Ile Thr Lys Tyr  
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Gly Ser Asp Pro Gln Leu Val Val Gly Arg Gln Ile Ala Val Asn Lys  
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Val Tyr Ile Cys Tyr Gly Leu Lys Gly Gly Asn Ile Arg Val Leu Asn  
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Ile Asn Thr Ala Leu Arg Ser Leu Phe Arg Gly His Ser Gln Arg Val  
225 230 235 240

Thr Asp Met Ala Phe Phe Ala Glu Asp Val Asp Met Leu Ala Ser Val  
245 250 255

Ser Leu Asp Gly Lys Val Phe Val Trp Lys Ile Ser Glu Gly Ser Glu  
260 265 270

Gly Glu Asp Gln Pro Gln Ile Thr Gly Lys Ile Val Leu Ala Leu Gln  
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Ile Leu Gly Glu Glu Asp Thr Lys His Pro Arg Val Cys Trp His Cys  
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His Lys Gln Glu Ile Leu Val Val Ser Ile Gly Lys His Val Leu Arg  
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Ile Asp Thr Thr Lys Val Gly Arg Gly Glu Val Phe Ser Ala Glu Ala  
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Pro Leu Gln Cys Pro Leu Asp Lys Leu Ile Asp Gly Val Gln Ile Val  
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Gly Lys His Asp Gly Glu Val Thr Asp Leu Ser Met Cys Gln Trp Met  
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Thr Thr Arg Leu Val Ser Ser Ser Val Asp Gly Thr Ile Lys Ile Trp  
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Gln Asp Arg Lys Ala Gln Pro Leu Val Val Leu Arg Pro His Asp Gly  
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His Pro Val Ser Ser Ala Thr Phe Val Thr Ser Pro Glu Arg Pro Asp  
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His Ile Ile Leu Ile Thr Gly Gly Pro Leu Asn Arg Glu Met Lys Ile  
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Trp Val Ser Ala Gly Glu Glu Gly Trp Leu Leu Pro Ala Asp Ala Glu  
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Ser Trp Arg Cys Thr Gln Thr Leu Asp Leu Lys Ser Ser Thr Glu Pro  
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Arg Ala Glu Glu Ala Phe Phe Asn Gln Val Ile Ala Leu Ser Glu Ala  
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Gly Leu Leu Leu Leu Ala Asn Ala Lys Arg Asn Ala Leu Tyr Ala Val  
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His Leu Asp Tyr Gly Ser Ser Pro Val Gly Thr Arg Met Asp Tyr Leu  
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Ser Glu Phe Thr Val Thr Met Pro Ile Leu Ser Phe Ile Gly Thr Asn  
 515 520 525

Asp Pro Pro Glu Glu Pro Ile Val Lys Val Tyr Cys Val Gln Thr Leu  
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545 550 555 560

Ile Glu Asn Met Gly Leu Glu Lys Ser Asp Ser Ser Val Ser Arg Glu  
565 570 575

Ala Asn Leu Val Glu Gly Met Ser Glu Pro Ser Gly Leu Lys Pro Thr  
580 585 590

Asp Leu Pro Ser Val Asp Ser Val Pro Lys Pro Ser Ile Ile Val Asn  
595 600 605

Arg Ser Glu Ser Ala Asn Lys Leu Ser Phe Pro Ser Ala Glu Ala Thr  
610 615 620

Ser Gln Ala Ile Val Pro Pro Asn Gly Glu Pro Lys Thr Ser Gly Leu  
625 630 635 640

Pro Ser Gln Thr Ser Gly Ala Gly Ser Ala Tyr Ala Thr Leu Pro Gln  
645 650 655

Leu Pro Leu Ser Pro Arg Leu Ser Ser Lys Leu Ser Gly Tyr His Thr  
660 665 670

Pro Val Glu Ala Ile Glu Pro Val Ile Pro His His Glu Leu Gly Gly  
675 680 685

Lys Thr Pro Ser Ala Asp Tyr Ser Val Asp Arg Gln Met Asp Ala Val  
690 695 700

Gly Glu Arg Asn Leu Asp Val Ser Ser Val Glu Glu Ile Ser Arg Ser  
705 710 715 720

Lys Asp Ser Asn Val Thr Pro Asp Asp Asp Val Ser Gly Met Arg Ser  
725 730 735

Pro Ser Ala Phe Phe Lys His Pro Thr His Leu Val Thr Pro Ser Glu  
740 745 750

Ile Leu Met Gly Val Ser Ser Ala Glu Ala Ser Ile Thr Thr Glu Asp  
755 760 765

Arg Arg Asp Arg Asp Ala Asn Ile Gln Asp Val Asn Asn Asp Pro Arg  
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Asp Thr Glu Val Glu Val Lys Glu Ile Ser Glu Ala Arg Ser Thr Gln  
785 790 795 800

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Glu Ser Lys Ala Tyr Gly Gln Pro Ile Lys Ala Gly Asp Glu Ser Gly  
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Val Asp Ser Arg Gly Gly Pro Ala Lys Leu Leu Lys Gly Lys Lys Gln  
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Lys Ala Lys Asn Ser Gln Gly Pro Gly Leu Ser Ser Thr Ser Ser Asn  
885 890 895

Val Ala Asn Leu Ala Asp Ser Phe Asn Glu Gln Ser Gln Ser Leu Ser  
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His Pro Met Thr Asp Leu Leu Pro Gln Leu Leu Ala Met Gln Glu Thr  
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Met Asn Gln Val Met Ala Ser Gln Lys Glu Met Gln Arg Gln Leu Ser  
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Asn Ala Ala Thr Gly Pro Ile Gly Lys Glu Ser Lys Arg Leu Glu Val  
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980 985 990

Arg Asp His Ala Gln Gln Ile Val Asn Ala Thr Thr Asn Phe Met Ser  
995 1000 1005

Lys Glu Leu Asn Ala Met Phe Glu Lys Thr Ile Lys Lys Glu Leu  
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Ala Ala Ile Gly Pro Ala Leu Ala Arg Ser Val Val Pro Val Ile  
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Glu Lys Thr Val Ser Ser Ala Ile Thr Glu Ser Phe Gln Arg Gly  
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1040

1045

Ile Gly Asp Lys Ala Val Asn Gln Leu Asp Lys Ser Val Asn Ile  
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Lys Leu Glu Ala Thr Val Ala Arg Gln Ile Gln Ala Gln Phe Gln  
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Glu Ser Ser Val Ile Pro Ser Phe Glu Lys Ala Cys Lys Ala Met  
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Phe Asp Gln Ile Asp Ser Ala Phe Gln Lys Gly Ile Ala Glu His  
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Ala His Thr Leu Lys Glu Ser Ile Thr Ser Ala Ser Ser Val Ala  
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Gln Ala Leu Ser Arg Glu Leu Ala Glu Thr Gln Arg Asn Leu Leu  
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Val Thr Gln Leu Ser Gly Gly Pro Leu Gly Ala Leu Leu Glu Lys  
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ttt ccc gat cga att ttc ccg cca ttc ctt gtt ccc aac acc cta gtt 96  
 Phe Pro Asp Arg Ile Phe Pro Pro Phe Leu Val Pro Asn Thr Leu Val  
 20 25 30

tcg cga cgc aat gtc agt cga gcg aac tcc ggc atc ttc tgt agt tct 144  
 Ser Arg Arg Asn Val Ser Arg Ala Asn Ser Gly Ile Phe Cys Ser Ser  
 35 40 45

gct tcc ggt cga aag act ctt ccc caa tcg gct atc cag aga atc gct 192  
 Ala Ser Gly Arg Lys Thr Leu Pro Gln Ser Ala Ile Gln Arg Ile Ala  
 50 55 60

gag aag ctt cgt agc ctt gga ttc gtg gaa gag aag cat gat tca ccg 240  
 Glu Lys Leu Arg Ser Leu Gly Phe Val Glu Glu Lys His Asp Ser Pro  
 65 70 75 80

act agg aga atc acg gga gaa gaa tct ggt aag aat tcc cca gga gag 288  
 Thr Arg Arg Ile Thr Gly Glu Glu Ser Gly Lys Asn Ser Pro Gly Glu  
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Gly	Pro	Arg	Phe	Thr	Asp	Trp	Trp	Ala	Tyr	Asp	Pro	Leu	Pro	Val	Asp	
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Gly	Asp	Leu	Leu	Pro	Ala	Val	Val	Pro	Asp	Tyr	Arg	Arg	Pro	Phe	Arg	
		355					360					365				
ctt	ctt	cca	tat	ggc	gtc	agt	cca	aaa	cta	act	gat	gat	gaa	atg	acc	1152
Leu	Leu	Pro	Tyr	Gly	Val	Ser	Pro	Lys	Leu	Thr	Asp	Asp	Glu	Met	Thr	
		370				375					380					
aca	ata	agg	aga	ctt	ggt	aga	cca	ctc	cct	tgt	cat	ttt	gct	tta	ggt	1200
Thr	Ile	Arg	Arg	Leu	Gly	Arg	Pro	Leu	Pro	Cys	His	Phe	Ala	Leu	Gly	
385					390					395					400	
agg	aat	aga	aat	ttg	cag	gga	cta	gct	gtt	gca	att	gtc	aag	ctt	tgg	1248
Arg	Asn	Arg	Asn	Leu	Gln	Gly	Leu	Ala	Val	Ala	Ile	Val	Lys	Leu	Trp	
				405					410					415		
gag	aaa	tgt	gag	ctt	gcc	aag	ata	gca	gtg	aag	aga	gga	gtt	cag	aac	1296
Glu	Lys	Cys	Glu	Leu	Ala	Lys	Ile	Ala	Val	Lys	Arg	Gly	Val	Gln	Asn	
			420					425					430			
act	aat	agt	gag	ctg	atg	gcc	gaa	gag	tta	aag	tgg	ttg	act	gga	ggg	1344
Thr	Asn	Ser	Glu	Leu	Met	Ala	Glu	Glu	Leu	Lys	Trp	Leu	Thr	Gly	Gly	
		435					440					445				
act	ctg	ata	tct	cgg	gat	aaa	gat	ttc	att	gtc	ctg	tac	aga	gga	aag	1392
Thr	Leu	Ile	Ser	Arg	Asp	Lys	Asp	Phe	Ile	Val	Leu	Tyr	Arg	Gly	Lys	
		450				455					460					
gat	ttc	ctc	cca	tct	gca	gtt	tct	tct	gca	ata	gaa	gag	agg	aga	agg	1440
Asp	Phe	Leu	Pro	Ser	Ala	Val	Ser	Ser	Ala	Ile	Glu	Glu	Arg	Arg	Arg	
465					470					475					480	
caa	aca	atg	ata	atg	gag	aat	tct	agt	gtg	cat	ggt	aat	aag	ctg	act	1488
Gln	Thr	Met	Ile	Met	Glu	Asn	Ser	Ser	Val	His	Gly	Asn	Lys	Leu	Thr	
				485					490					495		
gaa	aac	gaa	gag	gaa	ata	aaa	cct	cgg	gct	gtt	aaa	gag	gat	att	gaa	1536
Glu	Asn	Glu	Glu	Glu	Ile	Lys	Pro	Arg	Ala	Val	Lys	Glu	Asp	Ile	Glu	
			500					505					510			
cta	gaa	gct	aag	gat	cag	aag	gat	cat	ata	caa	acc	cat	cag	atg	aaa	1584
Leu	Glu	Ala	Lys	Asp	Gln	Lys	Asp	His	Ile	Gln	Thr	His	Gln	Met	Lys	
		515					520					525				
tca	aga	cag	cga	aat	tct	cct	gag	gca	atc	ctt	gaa	aaa	act	agt	atg	1632
Ser	Arg	Gln	Arg	Asn	Ser	Pro	Glu	Ala	Ile	Leu	Glu	Lys	Thr	Ser	Met	
		530				535					540					
aag	ttg	tcc	atg	gcg	ttg	gaa	aag	aaa	gca	aat	gca	gaa	aaa	gtc	ctg	1680
Lys	Leu	Ser	Met	Ala	Leu	Glu	Lys	Lys	Ala	Asn	Ala	Glu	Lys	Val	Leu	
545					550					555					560	
gcg	gat	ctg	gag	aat	aga	gag	agt	cct	caa	ctt	tct	gat	att	gac	aag	1728
Ala	Asp	Leu	Glu	Asn	Arg	Glu	Ser	Pro	Gln	Leu	Ser	Asp	Ile	Asp	Lys	
				565					570					575		
gag	ggt	att	act	aat	gat	gaa	aag	tac	atg	ctc	cgg	aaa	att	ggc	ttg	1776
Glu	Gly	Ile	Thr	Asn	Asp	Glu	Lys	Tyr	Met	Leu	Arg	Lys	Ile	Gly	Leu	
			580					585					590			

## 70166USNP.ST25

aaa atg aag cct ttc ctt tta cta ggt aga aga ggc gtc ttt gat gga Lys Met Lys Pro Phe Leu Leu Leu Gly Arg Arg Gly Val Phe Asp Gly	1824
595 600 605	
aca ata gag aac atg cat ctt cac tgg aag tat agg gaa ctt gtg aag Thr Ile Glu Asn Met His Leu His Trp Lys Tyr Arg Glu Leu Val Lys	1872
610 615 620	
atc att tgt aat gaa tat agc att gaa gct gct cac aaa gta gca gaa Ile Ile Cys Asn Glu Tyr Ser Ile Glu Ala Ala His Lys Val Ala Glu	1920
625 630 635 640	
atc ttg gaa gca gaa agt ggt ggc ata cta gtt gct gtg gag atg gtt Ile Leu Glu Ala Glu Ser Gly Gly Ile Leu Val Ala Val Glu Met Val	1968
645 650 655	
agt aag ggc tat gca atc att gtg tat cgt gga aag aat tat gag cgg Ser Lys Gly Tyr Ala Ile Ile Val Tyr Arg Gly Lys Asn Tyr Glu Arg	2016
660 665 670	
cct caa tgt cta cga cct caa aca ctt ctc agt aag aga gag gcg ctg Pro Gln Cys Leu Arg Pro Gln Thr Leu Leu Ser Lys Arg Glu Ala Leu	2064
675 680 685	
aag cgg tct gtg gag gca caa cgt cga aag tca ttg aag cta cat gtg Lys Arg Ser Val Glu Ala Gln Arg Arg Lys Ser Leu Lys Leu His Val	2112
690 695 700	
ctg aaa ctt tcc aac aat atc gaa gaa ttg aac cgt caa ttg gtc gag Leu Lys Leu Ser Asn Asn Ile Glu Glu Leu Asn Arg Gln Leu Val Glu	2160
705 710 715 720	
gac agc gca acc aat gaa act tgg tca gat ggg gaa tca agt aac atg Asp Ser Ala Thr Asn Glu Thr Trp Ser Asp Gly Glu Ser Ser Asn Met	2208
725 730 735	
atg gtc gaa gaa gaa aca gaa aat cag cat act gaa cct gag aaa gca Met Val Glu Glu Glu Thr Glu Asn Gln His Thr Glu Pro Glu Lys Ala	2256
740 745 750	
aga gaa aaa att gaa ctt ggc tat tca tct gac tta tca gtt cct tcc Arg Glu Lys Ile Glu Leu Gly Tyr Ser Ser Asp Leu Ser Val Pro Ser	2304
755 760 765	
tct ggt gaa gaa aac tgg gag gat gac agc gaa ggt gaa gta gac cca Ser Gly Glu Glu Asn Trp Glu Asp Asp Ser Glu Gly Glu Val Asp Pro	2352
770 775 780	
tta act acg agc agt cag gag tat caa gaa gat gaa tct gaa tct gcc Leu Thr Thr Ser Ser Gln Glu Tyr Gln Glu Asp Glu Ser Glu Ser Ala	2400
785 790 795 800	
tcg tct cag aga cac gag ggt aac tct ctc gat tca act gca aat ctg Ser Ser Gln Arg His Glu Gly Asn Ser Leu Asp Ser Thr Ala Asn Leu	2448
805 810 815	
tct gtg ttt gcg gaa acc ggt tcc gcc aat gct tct tca ttt cat gat Ser Val Phe Ala Glu Thr Gly Ser Ala Asn Ala Ser Ser Phe His Asp	2496
820 825 830	
aga tca ctg ccg cac aac agc ttc ctg aat gcc aat cga aag tta cca Arg Ser Leu Pro His Asn Ser Phe Leu Asn Ala Asn Arg Lys Leu Pro	2544
835 840 845	

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gga tca tca act gga agt ggc tca caa atc tca gct ctg aga gag agg Gly Ser Ser Thr Gly Ser Gly Ser Gln Ile Ser Ala Leu Arg Glu Arg 850 855 860	2592
aaa agc gaa aat gat ggg ttg gtc aca gat ctg tcc aat aga gaa agg Lys Ser Glu Asn Asp Gly Leu Val Thr Asp Leu Ser Asn Arg Glu Arg 865 870 875 880	2640
ctc att ctg aga aaa caa gcc ctt aag atg aaa aag cga cca ccc ttt Leu Ile Leu Arg Lys Gln Ala Leu Lys Met Lys Lys Arg Pro Pro Phe 885 890 895	2688
gca gta gga aga agc aac gtt gtt aca ggt tta gca aga aca ctg aag Ala Val Gly Arg Ser Asn Val Val Thr Gly Leu Ala Arg Thr Leu Lys 900 905 910	2736
atg cat ttt cag aaa aac cct cta gca atc gta aac gtc aaa gga aga Met His Phe Gln Lys Asn Pro Leu Ala Ile Val Asn Val Lys Gly Arg 915 920 925	2784
gca aat gga aca tct gtg caa gaa gtc atc gca aag cta aag gaa gaa Ala Asn Gly Thr Ser Val Gln Glu Val Ile Ala Lys Leu Lys Glu Glu 930 935 940	2832
aca gga gct ctt ctg gtg tca cag gag cca agt aaa gtc ata ctt tac Thr Gly Ala Leu Leu Val Ser Gln Glu Pro Ser Lys Val Ile Leu Tyr 945 950 955 960	2880
cgc gga tgg gga gcg gaa gaa gaa atg aaa agc ttc tac cca aat aac Arg Gly Trp Gly Ala Glu Glu Glu Met Lys Ser Phe Tyr Pro Asn Asn 965 970 975	2928
aat gtc aaa agc tct ata aat cta ccc tct acg aga agc ttt gtt gat Asn Val Lys Ser Ser Ile Asn Leu Pro Pro Ser Thr Arg Ser Phe Val Asp 980 985 990	2976
gat cct cct cat gtg tct cct gca ctc atc gaa gcc ata aga ctt gaa Asp Pro Pro His Val Ser Pro Ala Leu Ile Glu Ala Ile Arg Leu Glu 995 1000 1005	3024
tgt ggt ttg taa Cys Gly Leu 1010	3036

&lt;210&gt; 34

&lt;211&gt; 1011

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 34

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1				5					10					15	

Phe	Pro	Asp	Arg	Ile	Phe	Pro	Pro	Phe	Leu	Val	Pro	Asn	Thr	Leu	Val
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



20

25

30

Ser Arg Arg Asn Val Ser Arg Ala Asn Ser Gly Ile Phe Cys Ser Ser  
           35                          40                          45

Ala Ser Gly Arg Lys Thr Leu Pro Gln Ser Ala Ile Gln Arg Ile Ala  
       50                          55                          60

Glu Lys Leu Arg Ser Leu Gly Phe Val Glu Glu Lys His Asp Ser Pro  
   65                          70                          75                          80

Thr Arg Arg Ile Thr Gly Glu Glu Ser Gly Lys Asn Ser Pro Gly Glu  
                           85                          90                          95

Ile Phe Val Pro Leu Pro Lys Gln Leu Pro Ile His Arg Val Gly His  
                           100                          105                          110

Thr Ile Asp Thr Ser Trp Ser Thr Pro Ser Tyr Pro Val Pro Lys Pro  
           115                          120                          125

Gly Ser Gly Thr Ala Ile Ser Arg Tyr His Glu Leu Lys Arg Val Trp  
       130                          135                          140

Lys Lys Glu Thr Glu Met Glu Arg Lys Lys Glu Glu Lys Val Pro Ser  
   145                          150                          155                          160

Leu Ala Glu Leu Thr Leu Pro Pro Ala Glu Leu Arg Arg Leu Arg Thr  
                           165                          170                          175

Val Gly Ile Arg Leu Thr Lys Lys Leu Lys Ile Gly Lys Ala Gly Ile  
                           180                          185                          190

Thr Glu Gly Ile Val Asn Gly Ile His Glu Arg Trp Arg Thr Thr Glu  
           195                          200                          205

Val Val Lys Ile Phe Cys Glu Asp Ile Ser Arg Met Asn Met Lys Arg  
       210                          215                          220

Thr His Asp Val Leu Glu Thr Lys Thr Gly Gly Leu Val Ile Trp Arg  
   225                          230                          235                          240

Ser Gly Ser Lys Ile Leu Leu Tyr Arg Gly Val Asn Tyr Gln Tyr Pro  
                           245                          250                          255

Tyr Phe Val Ser Asp Arg Asp Leu Ala His Glu Ala Ala Ser Gly Ala  
                           260                          265                          270

Ser Ser Met Asp Gln Gly Val Val Asp Ser Arg Glu Lys Gln Ser Ile  
 275 280 285

Ala Glu Ser Ser Ala Pro Ser Ile Thr Asn Lys Met Val Lys Pro Met  
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Leu Thr Gln Gly Val Gly Ser Pro Asp Lys Val Arg Phe Gln Leu Pro  
 305 310 315 320

Gly Glu Val Gln Leu Val Glu Glu Ala Asp Arg Leu Leu Glu Gly Leu  
 325 330 335

Gly Pro Arg Phe Thr Asp Trp Trp Ala Tyr Asp Pro Leu Pro Val Asp  
 340 345 350

Gly Asp Leu Leu Pro Ala Val Val Pro Asp Tyr Arg Arg Pro Phe Arg  
 355 360 365

Leu Leu Pro Tyr Gly Val Ser Pro Lys Leu Thr Asp Asp Glu Met Thr  
 370 375 380

Thr Ile Arg Arg Leu Gly Arg Pro Leu Pro Cys His Phe Ala Leu Gly  
 385 390 395 400

Arg Asn Arg Asn Leu Gln Gly Leu Ala Val Ala Ile Val Lys Leu Trp  
 405 410 415

Glu Lys Cys Glu Leu Ala Lys Ile Ala Val Lys Arg Gly Val Gln Asn  
 420 425 430

Thr Asn Ser Glu Leu Met Ala Glu Glu Leu Lys Trp Leu Thr Gly Gly  
 435 440 445

Thr Leu Ile Ser Arg Asp Lys Asp Phe Ile Val Leu Tyr Arg Gly Lys  
 450 455 460

Asp Phe Leu Pro Ser Ala Val Ser Ser Ala Ile Glu Glu Arg Arg Arg  
 465 470 475 480

Gln Thr Met Ile Met Glu Asn Ser Ser Val His Gly Asn Lys Leu Thr  
 485 490 495

Glu Asn Glu Glu Glu Ile Lys Pro Arg Ala Val Lys Glu Asp Ile Glu  
 500 505 510

Leu Glu Ala Lys Asp Gln Lys Asp His Ile Gln Thr His Gln Met Lys  
 515 520 525

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Ser Arg Gln Arg Asn Ser Pro Glu Ala Ile Leu Glu Lys Thr Ser Met  
 530 535 540

Lys Leu Ser Met Ala Leu Glu Lys Lys Ala Asn Ala Glu Lys Val Leu  
 545 550 555 560

Ala Asp Leu Glu Asn Arg Glu Ser Pro Gln Leu Ser Asp Ile Asp Lys  
 565 570 575

Glu Gly Ile Thr Asn Asp Glu Lys Tyr Met Leu Arg Lys Ile Gly Leu  
 580 585 590

Lys Met Lys Pro Phe Leu Leu Leu Gly Arg Arg Gly Val Phe Asp Gly  
 595 600 605

Thr Ile Glu Asn Met His Leu His Trp Lys Tyr Arg Glu Leu Val Lys  
 610 615 620

Ile Ile Cys Asn Glu Tyr Ser Ile Glu Ala Ala His Lys Val Ala Glu  
 625 630 635 640

Ile Leu Glu Ala Glu Ser Gly Gly Ile Leu Val Ala Val Glu Met Val  
 645 650 655

Ser Lys Gly Tyr Ala Ile Ile Val Tyr Arg Gly Lys Asn Tyr Glu Arg  
 660 665 670

Pro Gln Cys Leu Arg Pro Gln Thr Leu Leu Ser Lys Arg Glu Ala Leu  
 675 680 685

Lys Arg Ser Val Glu Ala Gln Arg Arg Lys Ser Leu Lys Leu His Val  
 690 695 700

Leu Lys Leu Ser Asn Asn Ile Glu Glu Leu Asn Arg Gln Leu Val Glu  
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Asp Ser Ala Thr Asn Glu Thr Trp Ser Asp Gly Glu Ser Ser Asn Met  
 725 730 735

Met Val Glu Glu Glu Thr Glu Asn Gln His Thr Glu Pro Glu Lys Ala  
 740 745 750

Arg Glu Lys Ile Glu Leu Gly Tyr Ser Ser Asp Leu Ser Val Pro Ser  
 755 760 765

Ser Gly Glu Glu Asn Trp Glu Asp Asp Ser Glu Gly Glu Val Asp Pro  
 770 775 780

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Leu Thr Thr Ser Ser Gln Glu Tyr Gln Glu Asp Glu Ser Glu Ser Ala  
 785 790 795 800  
 Ser Ser Gln Arg His Glu Gly Asn Ser Leu Asp Ser Thr Ala Asn Leu  
 805 810 815  
 Ser Val Phe Ala Glu Thr Gly Ser Ala Asn Ala Ser Ser Phe His Asp  
 820 825 830  
 Arg Ser Leu Pro His Asn Ser Phe Leu Asn Ala Asn Arg Lys Leu Pro  
 835 840 845  
 Gly Ser Ser Thr Gly Ser Gly Ser Gln Ile Ser Ala Leu Arg Glu Arg  
 850 855 860  
 Lys Ser Glu Asn Asp Gly Leu Val Thr Asp Leu Ser Asn Arg Glu Arg  
 865 870 875 880  
 Leu Ile Leu Arg Lys Gln Ala Leu Lys Met Lys Lys Arg Pro Pro Phe  
 885 890 895  
 Ala Val Gly Arg Ser Asn Val Val Thr Gly Leu Ala Arg Thr Leu Lys  
 900 905 910  
 Met His Phe Gln Lys Asn Pro Leu Ala Ile Val Asn Val Lys Gly Arg  
 915 920 925  
 Ala Asn Gly Thr Ser Val Gln Glu Val Ile Ala Lys Leu Lys Glu Glu  
 930 935 940  
 Thr Gly Ala Leu Leu Val Ser Gln Glu Pro Ser Lys Val Ile Leu Tyr  
 945 950 955 960  
 Arg Gly Trp Gly Ala Glu Glu Glu Met Lys Ser Phe Tyr Pro Asn Asn  
 965 970 975  
 Asn Val Lys Ser Ser Ile Asn Leu Pro Ser Thr Arg Ser Phe Val Asp  
 980 985 990  
 Asp Pro Pro His Val Ser Pro Ala Leu Ile Glu Ala Ile Arg Leu Glu  
 995 1000 1005  
 Cys Gly Leu  
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&lt;211&gt; 654

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis thaliana

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(654)

&lt;223&gt;

&lt;400&gt; 35

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1 5 10 15	
cta tcg aac cct aga att tct caa gct tcc atg tct ttc tgt acc aac	96
Leu Ser Asn Pro Arg Ile Ser Gln Ala Ser Met Ser Phe Cys Thr Asn	
20 25 30	
aac atc act tcc cca gaa gac tcc gac ttt gac gag tta gaa tcg ccc	144
Asn Ile Thr Ser Pro Glu Asp Ser Asp Phe Asp Glu Leu Glu Ser Pro	
35 40 45	
att gaa cca aag gcc tca gat cca gtt tct cga ttt tcc gga gaa gaa	192
Ile Glu Pro Lys Ala Ser Asp Pro Val Ser Arg Phe Ser Gly Glu Glu	
50 55 60	
cgc gtt atg gaa gag cgt cca ctc gaa aat ggc ctt gac tct ggc att	240
Arg Val Met Glu Glu Arg Pro Leu Glu Asn Gly Leu Asp Ser Gly Ile	
65 70 75 80	
ttc aag gca ata ttg gtg ggg caa gtg ggt cag ctt cct ctg cag aag	288
Phe Lys Ala Ile Leu Val Gly Gln Val Gly Gln Leu Pro Leu Gln Lys	
85 90 95	
aag ctt aag agt ggt aga act gtc act ctc ttc tct gta gga act ggt	336
Lys Leu Lys Ser Gly Arg Thr Val Thr Leu Phe Ser Val Gly Thr Gly	
100 105 110	
ggg atc agg aac aac cgg aga ccg ctt att aac gaa gat ccg aga gag	384
Gly Ile Arg Asn Asn Arg Arg Pro Leu Ile Asn Glu Asp Pro Arg Glu	
115 120 125	
tat gcg agc cgg tct gcg gtg cag tgg cac cgt gtc tct gtt tac cct	432
Tyr Ala Ser Arg Ser Ala Val Gln Trp His Arg Val Ser Val Tyr Pro	
130 135 140	
gaa cgc ttg gca gat ctt gtg ttg aag aat gtt gaa ccc ggt act gtt	480
Glu Arg Leu Ala Asp Leu Val Leu Lys Asn Val Glu Pro Gly Thr Val	
145 150 155 160	
atc tac tta gag ggt aat ctg gag acg aag ata ttc act gat cct gtc	528
Ile Tyr Leu Glu Gly Asn Leu Glu Thr Lys Ile Phe Thr Asp Pro Val	
165 170 175	

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act ggt ttg gtt cga cgt ata aga gaa gta gca att cgt aga aac ggc 576  
 Thr Gly Leu Val Arg Arg Ile Arg Glu Val Ala Ile Arg Arg Asn Gly  
 180 185 190

cga gtt gtg ttt ttg gga aaa gcc ggt gat atg cag caa ccg agt tct 624  
 Arg Val Val Phe Leu Gly Lys Ala Gly Asp Met Gln Gln Pro Ser Ser  
 195 200 205

gct gag ctt aga ggc gtt ggc tac tac tga 654  
 Ala Glu Leu Arg Gly Val Gly Tyr Tyr  
 210 215

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<211> 217

<212> PRT

<213> Arabidopsis thaliana

<400> 36

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Leu Ser Asn Pro Arg Ile Ser Gln Ala Ser Met Ser Phe Cys Thr Asn  
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Asn Ile Thr Ser Pro Glu Asp Ser Asp Phe Asp Glu Leu Glu Ser Pro  
 35 40 45

Ile Glu Pro Lys Ala Ser Asp Pro Val Ser Arg Phe Ser Gly Glu Glu  
 50 55 60

Arg Val Met Glu Glu Arg Pro Leu Glu Asn Gly Leu Asp Ser Gly Ile  
 65 70 75 80

Phe Lys Ala Ile Leu Val Gly Gln Val Gly Gln Leu Pro Leu Gln Lys  
 85 90 95

Lys Leu Lys Ser Gly Arg Thr Val Thr Leu Phe Ser Val Gly Thr Gly  
 100 105 110

Gly Ile Arg Asn Asn Arg Arg Pro Leu Ile Asn Glu Asp Pro Arg Glu  
 115 120 125

Tyr Ala Ser Arg Ser Ala Val Gln Trp His Arg Val Ser Val Tyr Pro  
 130 135 140

Glu Arg Leu Ala Asp Leu Val Leu Lys Asn Val Glu Pro Gly Thr Val  
 Page 122

145 150 155 160

Ile Tyr Leu Glu Gly Asn Leu Glu Thr Lys Ile Phe Thr Asp Pro Val  
165 170 175

Thr Gly Leu Val Arg Arg Ile Arg Glu Val Ala Ile Arg Arg Asn Gly  
180 185 190

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195 200 205

Ala Glu Leu Arg Gly Val Gly Tyr Tyr  
210 215

<210> 37

<211> 1320

<212> DNA

<213> Arabidopsis thaliana

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<221> CDS

<222> (1)..(1320)

<223>

<400> 37

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gag gag caa gag gaa caa gat gtt gac att gag aac cag tat tat aac 96  
Glu Glu Gln Glu Glu Gln Asp Val Asp Ile Glu Asn Gln Tyr Tyr Asn  
20 25 30

tct aaa ggt atg gtt gag act gaa cct gaa gaa gca ctt tct gga ttt 144  
Ser Lys Gly Met Val Glu Thr Glu Pro Glu Glu Ala Leu Ser Gly Phe  
35 40 45

gct gag gtt gtt cag atg gaa cct gag aaa gct gac tgg ggt ttc aaa 192  
Ala Glu Val Val Gln Met Glu Pro Glu Lys Ala Asp Trp Gly Phe Lys  
50 55 60

gct ctt aag cag act gtg aag atc tat tat cgt cta ggt aaa tac aaa 240  
Ala Leu Lys Gln Thr Val Lys Ile Tyr Tyr Arg Leu Gly Lys Tyr Lys  
65 70 75 80

gaa atg atg gaa gcc tat aca gag atg ctt aca tat atc aag tca gca 288  
Glu Met Met Glu Ala Tyr Thr Glu Met Leu Thr Tyr Ile Lys Ser Ala  
85 90 95

## 70166USNP.ST25

gtc	acc	agg	aat	tac	agc	gaa	aaa	tgt	ata	aac	aat	atc	atg	gat	ttc	336
Val	Thr	Arg	Asn	Tyr	Ser	Glu	Lys	Cys	Ile	Asn	Asn	Ile	Met	Asp	Phe	
			100					105					110			
gtc	tct	gga	tct	gct	agc	cag	aac	act	ggc	ctg	ctg	caa	gag	ttc	tat	384
Val	Ser	Gly	Ser	Ala	Ser	Gln	Asn	Thr	Gly	Leu	Leu	Gln	Glu	Phe	Tyr	
		115					120					125				
cag	acc	act	ttg	aaa	gcc	ctt	gaa	gag	gct	aag	aat	gag	aga	ctc	tgg	432
Gln	Thr	Thr	Leu	Lys	Ala	Leu	Glu	Glu	Ala	Lys	Asn	Glu	Arg	Leu	Trp	
	130					135					140					
ttc	aag	aca	aat	ctt	aaa	ctc	tgc	aac	atc	tgg	ttt	gac	att	ggt	gaa	480
Phe	Lys	Thr	Asn	Leu	Lys	Leu	Cys	Asn	Ile	Trp	Phe	Asp	Ile	Gly	Glu	
145					150					155					160	
tac	aga	cgg	atg	act	aag	att	ctg	aag	gaa	ctc	cat	aag	tct	tgt	caa	528
Tyr	Arg	Arg	Met	Thr	Lys	Ile	Leu	Lys	Glu	Leu	His	Lys	Ser	Cys	Gln	
				165					170					175		
aag	gaa	gat	gga	act	gat	gat	cag	aag	aaa	gga	agt	cag	ctg	ctt	gag	576
Lys	Glu	Asp	Gly	Thr	Asp	Asp	Gln	Lys	Lys	Gly	Ser	Gln	Leu	Leu	Glu	
			180					185					190			
gtt	tat	gca	att	gaa	att	cag	att	tac	act	gaa	acg	aag	gac	aac	aaa	624
Val	Tyr	Ala	Ile	Glu	Ile	Gln	Ile	Tyr	Thr	Glu	Thr	Lys	Asp	Asn	Lys	
		195				200						205				
aag	ctt	aag	caa	cta	tac	cat	aag	gca	ctt	gcc	atc	aag	tct	gcc	ata	672
Lys	Leu	Lys	Gln	Leu	Tyr	His	Lys	Ala	Leu	Ala	Ile	Lys	Ser	Ala	Ile	
	210					215					220					
cct	cat	cct	agg	atc	atg	ggt	ata	atc	cgc	gag	tgt	ggt	gga	aaa	atg	720
Pro	His	Pro	Arg	Ile	Met	Gly	Ile	Ile	Arg	Glu	Cys	Gly	Gly	Lys	Met	
225					230					235					240	
cac	atg	gca	gaa	cgt	cag	tgg	gaa	gaa	gca	gcg	aca	gac	ttc	ttt	gag	768
His	Met	Ala	Glu	Arg	Gln	Trp	Glu	Glu	Ala	Ala	Thr	Asp	Phe	Phe	Glu	
				245					250					255		
gct	ttt	aaa	aat	tac	gat	gaa	gct	ggc	aac	caa	aga	cgt	ata	cag	tgc	816
Ala	Phe	Lys	Asn	Tyr	Asp	Glu	Ala	Gly	Asn	Gln	Arg	Arg	Ile	Gln	Cys	
			260					265					270			
ctg	aag	tat	ctt	gtt	ctg	gcg	aat	atg	ctg	atg	gag	tca	gaa	gtg	aat	864
Leu	Lys	Tyr	Leu	Val	Leu	Ala	Asn	Met	Leu	Met	Glu	Ser	Glu	Val	Asn	
		275					280					285				
ccg	ttt	gat	ggc	caa	gag	gca	aag	ccg	tac	aaa	aac	gac	cct	gag	att	912
Pro	Phe	Asp	Gly	Gln	Glu	Ala	Lys	Pro	Tyr	Lys	Asn	Asp	Pro	Glu	Ile	
	290					295					300					
ttg	gca	atg	aca	aat	ttg	atc	gca	gca	tat	caa	cga	aat	gag	atc	ata	960
Leu	Ala	Met	Thr	Asn	Leu	Ile	Ala	Ala	Tyr	Gln	Arg	Asn	Glu	Ile	Ile	
305					310					315					320	
gag	ttt	gag	aga	ata	cta	aag	agt	aac	cgg	agg	acg	ata	atg	gat	gat	1008
Glu	Phe	Glu	Arg	Ile	Leu	Lys	Ser	Asn	Arg	Arg	Thr	Ile	Met	Asp	Asp	
				325					330					335		
cca	ttc	atc	aga	aac	tac	atg	gaa	gat	ctg	ctg	aag	aaa	gtg	aga	aca	1056
Pro	Phe	Ile	Arg	Asn	Tyr	Met	Glu	Asp	Leu	Leu	Lys	Lys	Val	Arg	Thr	



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340	345	350	
caa gtg tta ctg aag ctg att aag cca tac aca aag ata ggg att ccg Gln Val Leu Leu Lys Leu Ile Lys Pro Tyr Thr Lys Ile Gly Ile Pro 355 360 365			1104
ttc ata tca aag gaa ctg aac gtg cca gag acg gat gtg acg gag tta Phe Ile Ser Lys Glu Leu Asn Val Pro Glu Thr Asp Val Thr Glu Leu 370 375 380			1152
cta gtg tcg ctg ata ctc gac agc aga atc gat ggt cac att gat gaa Leu Val Ser Leu Ile Leu Asp Ser Arg Ile Asp Gly His Ile Asp Glu 385 390 395 400			1200
atg aac cgt tac tta ctg aga ggc gac agt ggc aat gga agg aag ttg Met Asn Arg Tyr Leu Leu Arg Gly Asp Ser Gly Asn Gly Arg Lys Leu 405 410 415			1248
cat aag gcg gtt gat aaa tgg aac tca cag ctc aag tct ctt tct tca His Lys Ala Val Asp Lys Trp Asn Ser Gln Leu Lys Ser Leu Ser Ser 420 425 430			1296
aat atc acc agc cga gtc tgt taa Asn Ile Thr Ser Arg Val Cys 435			1320

&lt;210&gt; 38

&lt;211&gt; 439

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 38

Met Ala Ser Asp Ala Asp Met Glu Asp Tyr Gly Phe Glu Tyr Ser Asp  
1 5 10 15

Glu Glu Gln Glu Glu Gln Asp Val Asp Ile Glu Asn Gln Tyr Tyr Asn  
20 25 30

Ser Lys Gly Met Val Glu Thr Glu Pro Glu Glu Ala Leu Ser Gly Phe  
35 40 45

Ala Glu Val Val Gln Met Glu Pro Glu Lys Ala Asp Trp Gly Phe Lys  
50 55 60

Ala Leu Lys Gln Thr Val Lys Ile Tyr Tyr Arg Leu Gly Lys Tyr Lys  
65 70 75 80

Glu Met Met Glu Ala Tyr Thr Glu Met Leu Thr Tyr Ile Lys Ser Ala  
85 90 95

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Val Thr Arg Asn Tyr Ser Glu Lys Cys Ile Asn Asn Ile Met Asp Phe  
 100 105 110

Val Ser Gly Ser Ala Ser Gln Asn Thr Gly Leu Leu Gln Glu Phe Tyr  
 115 120 125

Gln Thr Thr Leu Lys Ala Leu Glu Glu Ala Lys Asn Glu Arg Leu Trp  
 130 135 140

Phe Lys Thr Asn Leu Lys Leu Cys Asn Ile Trp Phe Asp Ile Gly Glu  
 145 150 155 160

Tyr Arg Arg Met Thr Lys Ile Leu Lys Glu Leu His Lys Ser Cys Gln  
 165 170 175

Lys Glu Asp Gly Thr Asp Asp Gln Lys Lys Gly Ser Gln Leu Leu Glu  
 180 185 190

Val Tyr Ala Ile Glu Ile Gln Ile Tyr Thr Glu Thr Lys Asp Asn Lys  
 195 200 205

Lys Leu Lys Gln Leu Tyr His Lys Ala Leu Ala Ile Lys Ser Ala Ile  
 210 215 220

Pro His Pro Arg Ile Met Gly Ile Ile Arg Glu Cys Gly Gly Lys Met  
 225 230 235 240

His Met Ala Glu Arg Gln Trp Glu Glu Ala Ala Thr Asp Phe Phe Glu  
 245 250 255

Ala Phe Lys Asn Tyr Asp Glu Ala Gly Asn Gln Arg Arg Ile Gln Cys  
 260 265 270

Leu Lys Tyr Leu Val Leu Ala Asn Met Leu Met Glu Ser Glu Val Asn  
 275 280 285

Pro Phe Asp Gly Gln Glu Ala Lys Pro Tyr Lys Asn Asp Pro Glu Ile  
 290 295 300

Leu Ala Met Thr Asn Leu Ile Ala Ala Tyr Gln Arg Asn Glu Ile Ile  
 305 310 315 320

Glu Phe Glu Arg Ile Leu Lys Ser Asn Arg Arg Thr Ile Met Asp Asp  
 325 330 335

Pro Phe Ile Arg Asn Tyr Met Glu Asp Leu Leu Lys Lys Val Arg Thr  
 340 345 350

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Gln Val Leu Leu Lys Leu Ile Lys Pro Tyr Thr Lys Ile Gly Ile Pro  
 355 360 365

Phe Ile Ser Lys Glu Leu Asn Val Pro Glu Thr Asp Val Thr Glu Leu  
 370 375 380

Leu Val Ser Leu Ile Leu Asp Ser Arg Ile Asp Gly His Ile Asp Glu  
 385 390 395 400

Met Asn Arg Tyr Leu Leu Arg Gly Asp Ser Gly Asn Gly Arg Lys Leu  
 405 410 415

His Lys Ala Val Asp Lys Trp Asn Ser Gln Leu Lys Ser Leu Ser Ser  
 420 425 430

Asn Ile Thr Ser Arg Val Cys  
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<210> 39

<211> 1158

<212> DNA

<213> Arabidopsis thaliana

<220>

<221> CDS

<222> (1)..(1158)

<223>

<400> 39

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 Met Gly Phe Lys Leu Asn Ser Leu Phe Leu Leu Leu Ser Leu Leu Ile  
 1 5 10 15

ctc aca atc ttg tcc gga gcc gac caa gcc ttg gct tac gtc aag aaa 96  
 Leu Thr Ile Leu Ser Gly Ala Asp Gln Ala Leu Ala Tyr Val Lys Lys  
 20 25 30

cca cat gtg agc caa cgc aac aaa acg gcg tta gca gcc gtc gcc gga 144  
 Pro His Val Ser Gln Arg Asn Lys Thr Ala Leu Ala Ala Val Ala Gly  
 35 40 45

aga gga gga gga aaa gag atg ttg aaa ggg agg aag cag acg agt ggt 192  
 Arg Gly Gly Gly Lys Glu Met Leu Lys Gly Arg Lys Gln Thr Ser Gly  
 50 55 60

tgt aac ttg ttt caa ggg aga tgg gtt ttc gat gct tct tac cct ttc 240  
 Page 127

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Cys 65	Asn	Leu	Phe	Gln	Gly 70	Arg	Trp	Val	Phe	Asp 75	Ala	Ser	Tyr	Pro	Phe 80	
tac Tyr	gat Asp	tca Ser	tcc Ser	acg Thr 85	tgc Cys	cct Pro	ttc Phe	atc Ile	gac Asp 90	ggg Gly	gag Glu	ttc Phe	gac Asp	tgt Cys 95	cct Leu	288
aaa Lys	ttc Phe	ggc Gly	cga Arg 100	cca Pro	gac Asp	aaa Lys	cag Gln	ttc Phe 105	ctt Leu	aag Lys	tac Tyr	tct Ser	tgg Trp 110	cag Gln	cct Pro	336
gat Asp	tca Ser	tgc Cys 115	acc Thr	gtc Val	cca Pro	agg Arg	ttt Phe 120	gat Asp	ggg Gly	gaa Glu	gcg Ala	ttt Phe 125	ttg Leu	aag Lys	aaa Lys	384
tgg Trp	aga Arg 130	ggg Gly	aaa Lys	cga Arg	gtg Val	atg Met 135	ttc Phe	gtg Val	ggg Gly	gac Asp	tca Ser 140	ctg Leu	agt Ser	cta Leu	aac Asn	432
atg Met 145	tgg Trp	gaa Glu	tcg Ser	ttg Leu	gca Ala 150	tgt Cys	atg Met	ata Ile	cat His	tcg Ser 155	tcg Ser	gtt Val	cca Pro	aac Asn	act Thr 160	480
aag Lys	acc Thr	act Thr	ttt Phe	ctc Leu 165	aag Lys	cga Arg	acc Thr	cca Pro	ctc Leu 170	tcc Ser	tct Ser	ctc Leu	act Thr	ttc Phe 175	cag Gln	528
gaa Glu	tat Tyr	gac Asp	gtc Val 180	aca Thr	cta Leu	ttc Phe	cta Leu	tac Tyr 185	cga Arg	aca Thr	cca Pro	tac Tyr	cta Leu 190	gtg Val	gac Asp	576
atc Ile	tcc Ser	aaa Lys 195	gaa Glu	agt Ser	gtc Val	ggg Gly	cgt Arg 200	gtg Val	ctt Leu	aac Asn	ctt Leu	gga Gly 205	gcc Ala	att Ile	gaa Glu	624
gat Asp	gga Gly 210	gct Ala	gat Asp	gct Ala	tgg Trp	aaa Lys 215	aat Asn	atg Met	gac Asp	ctc Leu	ctc Leu 220	gtc Val	ttc Phe	aat Asn	tct Ser	672
tgg Trp 225	cac His	tgg Trp	tgg Trp	act Thr 230	cac His	aca Thr	gga Gly	gta Val	cag Gln	tct Ser 235	caa Gln	ggg Gly	tgg Trp	gat Asp	ttt Phe 240	720
ata Ile	aga Arg	gat Asp	ggg Gly	tct Ser 245	tca Ser	ctg Leu	atg Met	aga Arg	gac Asp 250	atg Met	gac Asp	cgc Arg	ctt Leu	gat Asp 255	gct Ala	768
ttc Phe	aac Asn	aaa Lys	gga Gly 260	ctc Leu	acc Thr	act Thr	tgg Trp	ggg Gly 265	caa Gln	tgg Trp	gtt Val	gat Asp	caa Gln 270	aat Asn	gtt Val	816
aat Asn	gtt Val	tcg Ser 275	caa Gln	acc Thr	cga Arg	gtc Val	ttc Phe 280	ttc Phe	caa Gln	ggc Gly	att Ile	tct Ser 285	ccc Pro	act Thr	cac His	864
tac Tyr	atg Met 290	gga Gly	agg Arg	gaa Glu	tgg Trp	aac Asn 295	gag Glu	ccg Pro	agg Arg	aaa Lys	act Thr 300	tgc Cys	aac Asn	ggg Gly	cag Gln	912
atg Met 305	caa Gln	ccg Pro	ttg Leu	acc Thr	gga Gly 310	tca Ser	aca Thr	tac Tyr	cca Pro	ggg Gly 315	ggg Gly	tca Ser	ctt Leu	cct Pro	gca Ala 320	960

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gca agc att gtg tct cga gta tta agc acg atg aga acg ccc gtt tac 1008  
Ala Ser Ile Val Ser Arg Val Leu Ser Thr Met Arg Thr Pro Val Tyr  
325 330 335

tta ctc gac atc aca act cta tct caa ctg aga aaa gat gct cat cca 1056  
Leu Leu Asp Ile Thr Thr Leu Ser Gln Leu Arg Lys Asp Ala His Pro  
340 345 350

tct aca tat gga ggc gat ggc gga acg gat tgc agt cac tgg tgc ctt 1104  
Ser Thr Tyr Gly Gly Asp Gly Gly Thr Asp Cys Ser His Trp Cys Leu  
355 360 365

cct ggc ttg ccg gat act tgg aac cag ctt ctc tat gca gct ctt tcg 1152  
Pro Gly Leu Pro Asp Thr Trp Asn Gln Leu Leu Tyr Ala Ala Leu Ser  
370 375 380

atg tga 1158  
Met  
385

<210> 40

<211> 385

<212> PRT

<213> Arabidopsis thaliana

<400> 40

Met Gly Phe Lys Leu Asn Ser Leu Phe Leu Leu Leu Ser Leu Leu Ile  
1 5 10 15

Leu Thr Ile Leu Ser Gly Ala Asp Gln Ala Leu Ala Tyr Val Lys Lys  
20 25 30

Pro His Val Ser Gln Arg Asn Lys Thr Ala Leu Ala Ala Val Ala Gly  
35 40 45

Arg Gly Gly Gly Lys Glu Met Leu Lys Gly Arg Lys Gln Thr Ser Gly  
50 55 60

Cys Asn Leu Phe Gln Gly Arg Trp Val Phe Asp Ala Ser Tyr Pro Phe  
65 70 75 80

Tyr Asp Ser Ser Thr Cys Pro Phe Ile Asp Gly Glu Phe Asp Cys Leu  
85 90 95

Lys Phe Gly Arg Pro Asp Lys Gln Phe Leu Lys Tyr Ser Trp Gln Pro  
100 105 110

Asp Ser Cys Thr Val Pro Arg Phe Asp Gly Glu Ala Phe Leu Lys Lys  
115 120 125

## 70166USNP.ST25

Trp Arg Gly Lys Arg Val Met Phe Val Gly Asp Ser Leu Ser Leu Asn  
 130 135 140

Met Trp Glu Ser Leu Ala Cys Met Ile His Ser Ser Val Pro Asn Thr  
 145 150 155 160

Lys Thr Thr Phe Leu Lys Arg Thr Pro Leu Ser Ser Leu Thr Phe Gln  
 165 170 175

Glu Tyr Asp Val Thr Leu Phe Leu Tyr Arg Thr Pro Tyr Leu Val Asp  
 180 185 190

Ile Ser Lys Glu Ser Val Gly Arg Val Leu Asn Leu Gly Ala Ile Glu  
 195 200 205

Asp Gly Ala Asp Ala Trp Lys Asn Met Asp Leu Leu Val Phe Asn Ser  
 210 215 220

Trp His Trp Trp Thr His Thr Gly Val Gln Ser Gln Gly Trp Asp Phe  
 225 230 235 240

Ile Arg Asp Gly Ser Ser Leu Met Arg Asp Met Asp Arg Leu Asp Ala  
 245 250 255

Phe Asn Lys Gly Leu Thr Thr Trp Gly Gln Trp Val Asp Gln Asn Val  
 260 265 270

Asn Val Ser Gln Thr Arg Val Phe Phe Gln Gly Ile Ser Pro Thr His  
 275 280 285

Tyr Met Gly Arg Glu Trp Asn Glu Pro Arg Lys Thr Cys Asn Gly Gln  
 290 295 300

Met Gln Pro Leu Thr Gly Ser Thr Tyr Pro Gly Gly Ser Leu Pro Ala  
 305 310 315 320

Ala Ser Ile Val Ser Arg Val Leu Ser Thr Met Arg Thr Pro Val Tyr  
 325 330 335

Leu Leu Asp Ile Thr Thr Leu Ser Gln Leu Arg Lys Asp Ala His Pro  
 340 345 350

Ser Thr Tyr Gly Gly Asp Gly Gly Thr Asp Cys Ser His Trp Cys Leu  
 355 360 365

Pro Gly Leu Pro Asp Thr Trp Asn Gln Leu Leu Tyr Ala Ala Leu Ser  
 Page 130

370

375

Met  
385

&lt;210&gt; 41

&lt;211&gt; 1194

&lt;212&gt; DNA

<213> *Arabidopsis thaliana*

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(1194)

&lt;223&gt;

&lt;400&gt; 41

atg	tta	cag	tcc	att	cat	ctt	cgt	ttt	tcc	tcc	aca	cca	tca	cct	tct	48
Met	Leu	Gln	Ser	Ile	His	Leu	Arg	Phe	Ser	Ser	Thr	Pro	Ser	Pro	Ser	
1				5				10						15		

aaa	aga	gaa	tct	ctc	ata	att	cca	tcg	gtt	att	tgc	tca	ttt	cct	ttc	96
Lys	Arg	Glu	Ser	Leu	Ile	Ile	Pro	Ser	Val	Ile	Cys	Ser	Phe	Pro	Phe	
			20					25					30			

acc	tct	tct	tcg	ttc	cgt	cca	aag	caa	acc	cag	aaa	ctg	aag	cgt	ctg	144
Thr	Ser	Ser	Ser	Phe	Arg	Pro	Lys	Gln	Thr	Gln	Lys	Leu	Lys	Arg	Leu	
			35				40					45				

gtt	caa	ttt	tgc	gct	cct	tac	gag	gtc	gga	ggg	gga	tac	acc	gat	gaa	192
Val	Gln	Phe	Cys	Ala	Pro	Tyr	Glu	Val	Gly	Gly	Gly	Tyr	Thr	Asp	Glu	
	50					55					60					

gaa	ttg	ttc	gaa	aga	tac	gga	act	cag	caa	aat	caa	act	aat	gtc	aaa	240
Glu	Leu	Phe	Glu	Arg	Tyr	Gly	Thr	Gln	Gln	Asn	Gln	Thr	Asn	Val	Lys	
65					70					75				80		

gat	aaa	tta	gat	cca	gct	gag	tat	gaa	gct	ttg	ctt	aaa	gga	ggc	gaa	288
Asp	Lys	Leu	Asp	Pro	Ala	Glu	Tyr	Glu	Ala	Leu	Leu	Lys	Gly	Gly	Glu	
				85					90					95		

caa	gtg	aca	tcc	gtt	ctt	gaa	gaa	atg	att	acc	ctc	ttg	gaa	gat	atg	336
Gln	Val	Thr	Ser	Val	Leu	Glu	Glu	Met	Ile	Thr	Leu	Leu	Glu	Asp	Met	
			100					105					110			

aag	atg	aat	gaa	gca	tct	gag	aat	gtt	gct	gta	gaa	ttg	gct	gca	caa	384
Lys	Met	Asn	Glu	Ala	Ser	Glu	Asn	Val	Ala	Val	Glu	Leu	Ala	Ala	Gln	
		115					120					125				

gga	gtt	ata	ggg	aaa	agg	gtc	gat	gaa	atg	gaa	tca	ggg	ttt	atg	atg	432
Gly	Val	Ile	Gly	Lys	Arg	Val	Asp	Glu	Met	Glu	Ser	Gly	Phe	Met	Met	
	130					135					140					

## 70166USNP.ST25

gct Ala 145	ctt Leu	gat Asp	tac Tyr	atg Met	atc Ile 150	caa Gln	ctt Leu	gca Ala	gac Asp	aaa Lys 155	gac Asp	caa Gln	gac Asp	gag Glu	aag Lys 160	480
aga Arg	aag Lys	tct Ser	tta Leu 165	cta Leu 165	gag Glu	gtc Val	gtc Val	aag Lys	gag Glu 170	act Thr	gtc Val	tta Leu	tct Ser	cat His 175	ctc Leu	528
acc Thr	aag Lys	aaa Lys	tgc Cys 180	cct Pro	cct Pro	cat His	gtc Val	cag Gln 185	gtg Val	att Ile	ggg Gly	tta Leu	ctc Leu 190	tgt Cys	aga Arg	576
acc Thr	ccg Pro	aaa Lys 195	aag Lys	gaa Glu	agt Ser	aga Arg	cat His 200	gag Glu	ctt Leu	ctg Leu	cgt Arg	agg Arg 205	gtg Val	gct Ala	gca Ala	624
ggg Gly	ggg Gly 210	ggg Gly	gct Ala	ttt Phe	gaa Glu	agt Ser 215	gag Glu	aac Asn	ggg Gly	act Thr	aaa Lys 220	ctt Leu	cat His	ata Ile	ccc Pro	672
gga Gly 225	gca Ala	aat Asn	ctg Leu	aat Asn	gac Asp 230	ata Ile	gct Ala	aat Asn	caa Gln	gct Ala 235	gat Asp	gac Asp	ttg Leu	cta Leu	gag Glu 240	720
act Thr	atg Met	gaa Glu	aca Thr	agg Arg 245	cca Pro	gct Ala	att Ile	ccg Pro	gat Asp 250	cga Arg	aaa Lys	cta Leu	cta Leu	gcg Ala 255	agg Arg	768
ctt Leu	gtt Val	ttg Leu	att Ile 260	aga Arg	gag Glu	gaa Glu	gcc Ala	cgg Arg 265	aac Asn	atg Met	atg Met	gga Gly	gga Gly 270	ggg Gly	ata Ile	816
ctt Leu	gat Asp	gaa Glu 275	aga Arg	aat Asn	gac Asp	cga Arg	ggg Gly 280	ttc Phe	act Thr	act Thr	ctt Leu	cct Pro 285	gaa Glu	tca Ser	gag Glu	864
gtg Val	aat Asn 290	ttc Phe	tta Leu	gcc Ala	aaa Lys	ttg Leu 295	gta Val	gct Ala	ctg Leu	aaa Lys	cct Pro 300	gga Gly	aag Lys	act Thr	gtg Val	912
cag Gln 305	cag Gln	atg Met	atc Ile	cag Gln	aat Asn 310	gta Val	atg Met	caa Gln	ggg Gly 315	aaa Lys	gat Asp	gaa Glu	ggc Gly	gca Ala	gat Asp 320	960
aat Asn	ctt Leu	agc Ser	aaa Lys	gaa Glu 325	tcc Ser	gat Asp	tct Ser	tct Ser	acc Thr 330	gaa Glu	gga Gly	aga Arg	aaa Lys	cca Pro 335	agt Ser	1008
gga Gly	tta Leu	aaa Lys	gga Gly 340	agg Arg	gga Gly	agc Ser	gtt Val	aca Thr 345	gga Gly	aga Arg	aaa Lys	ccg Pro	tta Leu 350	cca Pro	gta Val	1056
aga Arg	cca Pro	gga Gly 355	atg Met	ttt Phe	cta Leu	gaa Glu	act Thr 360	gtc Val	aca Thr	aag Lys	gta Val	ctg Leu 365	gga Gly	agt Ser	ata Ile	1104
tac Tyr	tcg Ser 370	ggg Gly	aat Asn	gcc Ala	tcc Ser	ggg Gly 375	ata Ile	aca Thr	gca Ala	caa Gln	cat His 380	cta Leu	gaa Glu	tgg Trp	gtt Val	1152
cac His	caa Gln	aaa Lys	acc Thr	ctc Leu	caa Gln	gtt Val	ctt Leu	gaa Glu	gaa Glu	atc Ile	gct Ala	tat Tyr	tag			1194



385

390

395

&lt;210&gt; 42

&lt;211&gt; 397

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 42

Met Leu Gln Ser Ile His Leu Arg Phe Ser Ser Thr Pro Ser Pro Ser  
 1 5 10 15

Lys Arg Glu Ser Leu Ile Ile Pro Ser Val Ile Cys Ser Phe Pro Phe  
 20 25 30

Thr Ser Ser Ser Phe Arg Pro Lys Gln Thr Gln Lys Leu Lys Arg Leu  
 35 40 45

Val Gln Phe Cys Ala Pro Tyr Glu Val Gly Gly Gly Tyr Thr Asp Glu  
 50 55 60

Glu Leu Phe Glu Arg Tyr Gly Thr Gln Gln Asn Gln Thr Asn Val Lys  
 65 70 75 80

Asp Lys Leu Asp Pro Ala Glu Tyr Glu Ala Leu Leu Lys Gly Gly Glu  
 85 90 95

Gln Val Thr Ser Val Leu Glu Glu Met Ile Thr Leu Leu Glu Asp Met  
 100 105 110

Lys Met Asn Glu Ala Ser Glu Asn Val Ala Val Glu Leu Ala Ala Gln  
 115 120 125

Gly Val Ile Gly Lys Arg Val Asp Glu Met Glu Ser Gly Phe Met Met  
 130 135 140

Ala Leu Asp Tyr Met Ile Gln Leu Ala Asp Lys Asp Gln Asp Glu Lys  
 145 150 155 160

Arg Lys Ser Leu Leu Glu Val Val Lys Glu Thr Val Leu Ser His Leu  
 165 170 175

Thr Lys Lys Cys Pro Pro His Val Gln Val Ile Gly Leu Leu Cys Arg  
 180 185 190

Thr Pro Lys Lys Glu Ser Arg His Glu Leu Leu Arg Arg Val Ala Ala  
 195 200 205

Gly Gly Gly Ala Phe Glu Ser Glu Asn Gly Thr Lys Leu His Ile Pro  
 210 215 220

Gly Ala Asn Leu Asn Asp Ile Ala Asn Gln Ala Asp Asp Leu Leu Glu  
 225 230 235 240

Thr Met Glu Thr Arg Pro Ala Ile Pro Asp Arg Lys Leu Leu Ala Arg  
 245 250 255

Leu Val Leu Ile Arg Glu Glu Ala Arg Asn Met Met Gly Gly Gly Ile  
 260 265 270

Leu Asp Glu Arg Asn Asp Arg Gly Phe Thr Thr Leu Pro Glu Ser Glu  
 275 280 285

Val Asn Phe Leu Ala Lys Leu Val Ala Leu Lys Pro Gly Lys Thr Val  
 290 295 300

Gln Gln Met Ile Gln Asn Val Met Gln Gly Lys Asp Glu Gly Ala Asp  
 305 310 315 320

Asn Leu Ser Lys Glu Ser Asp Ser Ser Thr Glu Gly Arg Lys Pro Ser  
 325 330 335

Gly Leu Lys Gly Arg Gly Ser Val Thr Gly Arg Lys Pro Leu Pro Val  
 340 345 350

Arg Pro Gly Met Phe Leu Glu Thr Val Thr Lys Val Leu Gly Ser Ile  
 355 360 365

Tyr Ser Gly Asn Ala Ser Gly Ile Thr Ala Gln His Leu Glu Trp Val  
 370 375 380

His Gln Lys Thr Leu Gln Val Leu Glu Glu Ile Ala Tyr  
 385 390 395

<210> 43

<211> 2451

<212> DNA

<213> Arabidopsis thaliana

<220>

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&lt;221&gt; CDS

&lt;222&gt; (1)..(2451)

&lt;223&gt;

&lt;400&gt; 43

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Met	Leu	Arg	Gln	Ile	Pro	Thr	Cys	Lys	Gly	Gly	Arg	Phe	Thr	Arg	Val	
1				5					10					15		

ttg	caa	tct	atc	gga	tca	ggt	att	aga	gaa	ttt	tca	gca	tct	gca	aat	96
Leu	Gln	Ser	Ile	Gly	Ser	Val	Ile	Arg	Glu	Phe	Ser	Ala	Ser	Ala	Asn	
			20					25					30			

gct	ttg	caa	gac	tgt	tgg	aaa	aat	ggg	aat	gaa	agt	aaa	gag	att	gat	144
Ala	Leu	Gln	Asp	Cys	Trp	Lys	Asn	Gly	Asn	Glu	Ser	Lys	Glu	Ile	Asp	
		35					40					45				

gat	ggt	cac	aca	ctt	ttc	aga	tat	tgc	act	aat	ttg	caa	tca	gcc	aaa	192
Asp	Val	His	Thr	Leu	Phe	Arg	Tyr	Cys	Thr	Asn	Leu	Gln	Ser	Ala	Lys	
	50					55					60					

tgt	ctc	cac	gca	cgt	ctc	ggt	gtc	tcc	aaa	caa	atc	caa	aat	ggt	tgt	240
Cys	Leu	His	Ala	Arg	Leu	Val	Val	Ser	Lys	Gln	Ile	Gln	Asn	Val	Cys	
65					70				75					80		

atc	tct	gct	aaa	ctt	ggt	aat	ctc	tat	tgt	tac	ctt	ggc	aat	gtc	gca	288
Ile	Ser	Ala	Lys	Leu	Val	Asn	Leu	Tyr	Cys	Tyr	Leu	Gly	Asn	Val	Ala	
				85					90					95		

ttg	gct	agg	cac	acg	ttt	gat	cat	atc	cag	aac	aga	gat	gta	tac	gct	336
Leu	Ala	Arg	His	Thr	Phe	Asp	His	Ile	Gln	Asn	Arg	Asp	Val	Tyr	Ala	
			100					105					110			

tgg	aat	ttg	atg	att	tct	ggt	tat	ggc	cgt	gcg	gga	aat	tct	tca	gaa	384
Trp	Asn	Leu	Met	Ile	Ser	Gly	Tyr	Gly	Arg	Ala	Gly	Asn	Ser	Ser	Glu	
		115					120					125				

gtg	att	agg	tgt	ttt	agt	ctc	ttt	atg	ttg	agt	tct	gga	ctt	aca	cct	432
Val	Ile	Arg	Cys	Phe	Ser	Leu	Phe	Met	Leu	Ser	Ser	Gly	Leu	Thr	Pro	
	130					135					140					

gat	tac	agg	act	ttt	cct	tcg	ggt	ttg	aaa	gct	tgt	agg	act	gtg	att	480
Asp	Tyr	Arg	Thr	Phe	Pro	Ser	Val	Leu	Lys	Ala	Cys	Arg	Thr	Val	Ile	
	145				150					155					160	

gat	ggg	aat	aag	att	cat	tgc	ttg	gct	ttg	aag	ttt	ggg	ttt	atg	tgg	528
Asp	Gly	Asn	Lys	Ile	His	Cys	Leu	Ala	Leu	Lys	Phe	Gly	Phe	Met	Trp	
				165					170					175		

gat	gtc	tat	ggt	gct	gcc	tcg	ttg	att	cat	ttg	tac	tct	cga	tat	aaa	576
Asp	Val	Tyr	Val	Ala	Ala	Ser	Leu	Ile	His	Leu	Tyr	Ser	Arg	Tyr	Lys	
			180					185					190			

gct	gtg	ggg	aat	gca	cgt	ata	ctg	ttt	gat	gaa	atg	cct	gta	aga	gat	624
Ala	Val	Gly	Asn	Ala	Arg	Ile	Leu	Phe	Asp	Glu	Met	Pro	Val	Arg	Asp	
		195					200					205				

atg	ggg	tct	tgg	aat	gca	atg	att	tct	ggg	tat	tgt	caa	agc	gga	aat	672

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Met	Gly	Ser	Trp	Asn	Ala	Met	Ile	Ser	Gly	Tyr	Cys	Gln	Ser	Gly	Asn	
210						215					220					
gct	aaa	gag	gcg	tta	act	ctg	tct	aat	ggg	ttg	aga	gct	atg	gat	tca	720
Ala	Lys	Glu	Ala	Leu	Thr	Leu	Ser	Asn	Gly	Leu	Arg	Ala	Met	Asp	Ser	
225					230				235						240	
ggt	acc	gtt	gtg	agt	ctc	ctt	tcg	gct	tgc	act	gaa	gcc	ggt	gat	ttc	768
Val	Thr	Val	Val	Ser	Leu	Leu	Ser	Ala	Cys	Thr	Glu	Ala	Gly	Asp	Phe	
				245					250					255		
aat	aga	gga	gtt	act	att	cat	tca	tac	tcg	ata	aaa	cat	ggt	ctg	gag	816
Asn	Arg	Gly	Val	Thr	Ile	His	Ser	Tyr	Ser	Ile	Lys	His	Gly	Leu	Glu	
			260					265					270			
tcc	gaa	ttg	ttt	gtt	tcc	aac	aag	ctg	att	gat	ttg	tat	gct	gaa	ttt	864
Ser	Glu	Leu	Phe	Val	Ser	Asn	Lys	Leu	Ile	Asp	Leu	Tyr	Ala	Glu	Phe	
		275					280					285				
ggt	agg	ctt	agg	gat	tgc	cag	aag	gtt	ttt	gat	agg	atg	tat	gtg	agg	912
Gly	Arg	Leu	Arg	Asp	Cys	Gln	Lys	Val	Phe	Asp	Arg	Met	Tyr	Val	Arg	
	290					295					300					
gat	ttg	att	tct	tgg	aat	tcg	ata	att	aag	gcg	tac	gag	ctg	aat	gag	960
Asp	Leu	Ile	Ser	Trp	Asn	Ser	Ile	Ile	Lys	Ala	Tyr	Glu	Leu	Asn	Glu	
305					310					315					320	
cag	ccg	ctt	aga	gcg	att	tcg	ttg	ttt	cag	gag	atg	cgg	ttg	agt	aga	1008
Gln	Pro	Leu	Arg	Ala	Ile	Ser	Leu	Phe	Gln	Glu	Met	Arg	Leu	Ser	Arg	
				325					330					335		
att	caa	cca	gat	tgc	ctt	act	ttg	att	agt	ttg	gct	tct	ata	cta	tca	1056
Ile	Gln	Pro	Asp	Cys	Leu	Thr	Leu	Ile	Ser	Leu	Ala	Ser	Ile	Leu	Ser	
			340					345					350			
cag	tta	ggg	gac	att	cgt	gct	tgt	aga	tct	gtg	cag	ggt	ttc	act	ttg	1104
Gln	Leu	Gly	Asp	Ile	Arg	Ala	Cys	Arg	Ser	Val	Gln	Gly	Phe	Thr	Leu	
		355					360					365				
agg	aaa	ggc	tgg	ttc	ttg	gaa	gat	att	acc	atc	ggg	aat	gct	gtt	gtg	1152
Arg	Lys	Gly	Trp	Phe	Leu	Glu	Asp	Ile	Thr	Ile	Gly	Asn	Ala	Val	Val	
	370					375					380					
gtt	atg	tat	gca	aaa	cta	ggc	ctt	gta	gat	tca	gca	aga	gca	gtg	ttt	1200
Val	Met	Tyr	Ala	Lys	Leu	Gly	Leu	Val	Asp	Ser	Ala	Arg	Ala	Val	Phe	
385					390					395					400	
aat	tgg	ctt	ccg	aat	aca	gat	gtt	att	tca	tgg	aat	acc	ata	atc	tcg	1248
Asn	Trp	Leu	Pro	Asn	Thr	Asp	Val	Ile	Ser	Trp	Asn	Thr	Ile	Ile	Ser	
				405					410					415		
ggt	tat	gct	caa	aac	ggt	ttt	gct	agt	gaa	gca	att	gaa	atg	tat	aac	1296
Gly	Tyr	Ala	Gln	Asn	Gly	Phe	Ala	Ser	Glu	Ala	Ile	Glu	Met	Tyr	Asn	
			420					425					430			
ata	atg	gag	gaa	gaa	ggt	gaa	ata	gcc	gct	aac	caa	ggg	act	tgg	gtg	1344
Ile	Met	Glu	Glu	Glu	Gly	Glu	Ile	Ala	Ala	Asn	Gln	Gly	Thr	Trp	Val	
			435				440					445				
agt	gtt	ttg	ccc	gct	tgt	tcg	cag	gct	gga	gcg	ttg	cgt	caa	ggt	atg	1392
Ser	Val	Leu	Pro	Ala	Cys	Ser	Gln	Ala	Gly	Ala	Leu	Arg	Gln	Gly	Met	
	450					455					460					

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aaa	ctc	cat	ggc	cgt	ctc	ttg	aag	aac	ggg	ctt	tat	ttg	gat	gtt	ttt	1440
Lys	Leu	His	Gly	Arg	Leu	Leu	Lys	Asn	Gly	Leu	Tyr	Leu	Asp	Val	Phe	
465				470					475						480	
gtt	gtt	aca	agc	ctt	gct	gat	atg	tat	gga	aag	tgt	gga	cga	cta	gag	1488
Val	Val	Thr	Ser	Leu	Ala	Asp	Met	Tyr	Gly	Lys	Cys	Gly	Arg	Leu	Glu	
				485					490					495		
gat	gcc	ctc	tct	ttg	ttt	tat	caa	atc	cca	aga	gtc	aac	tct	gtg	cca	1536
Asp	Ala	Leu	Ser	Leu	Phe	Tyr	Gln	Ile	Pro	Arg	Val	Asn	Ser	Val	Pro	
			500					505					510			
tgg	aac	acc	cta	ata	gcg	tgt	cac	ggg	ttt	cac	ggg	cat	ggc	gag	aaa	1584
Trp	Asn	Thr	Leu	Ile	Ala	Cys	His	Gly	Phe	His	Gly	His	Gly	Glu	Lys	
		515					520					525				
gca	gtg	atg	ctg	ttc	aaa	gaa	atg	ctg	gat	gaa	gga	gtg	aag	cca	gat	1632
Ala	Val	Met	Leu	Phe	Lys	Glu	Met	Leu	Asp	Glu	Gly	Val	Lys	Pro	Asp	
	530					535					540					
cac	att	aca	ttt	gtg	act	ctg	tta	tcg	gct	tgt	agc	cat	tct	ggg	tta	1680
His	Ile	Thr	Phe	Val	Thr	Leu	Leu	Ser	Ala	Cys	Ser	His	Ser	Gly	Leu	
545					550					555					560	
gta	gac	gag	ggg	caa	tgg	tgc	ttt	gag	atg	atg	caa	acg	gat	tat	ggg	1728
Val	Asp	Glu	Gly	Gln	Trp	Cys	Phe	Glu	Met	Met	Gln	Thr	Asp	Tyr	Gly	
				565					570					575		
ata	aca	ccg	agc	ttg	aaa	cat	tac	ggg	tgt	atg	gta	gat	atg	tat	ggg	1776
Ile	Thr	Pro	Ser	Leu	Lys	His	Tyr	Gly	Cys	Met	Val	Asp	Met	Tyr	Gly	
			580					585					590			
cga	gct	ggg	cag	tta	gaa	acc	gcg	ttg	aag	ttt	ata	aaa	agt	atg	tcg	1824
Arg	Ala	Gly	Gln	Leu	Glu	Thr	Ala	Leu	Lys	Phe	Ile	Lys	Ser	Met	Ser	
		595					600					605				
ctt	cag	cct	gat	gca	tcc	att	tgg	gga	gct	ctt	ctc	agc	gct	tgt	aga	1872
Leu	Gln	Pro	Asp	Ala	Ser	Ile	Trp	Gly	Ala	Leu	Leu	Ser	Ala	Cys	Arg	
	610					615					620					
gtc	cat	ggg	aat	gtt	gat	ctt	ggc	aag	atc	gca	tct	gaa	cat	ttg	ttc	1920
Val	His	Gly	Asn	Val	Asp	Leu	Gly	Lys	Ile	Ala	Ser	Glu	His	Leu	Phe	
					630					635					640	
gag	gtt	gaa	cct	gag	cat	gtc	ggg	tat	cat	gtt	cta	ttg	tca	aac	atg	1968
Glu	Val	Glu	Pro	Glu	His	Val	Gly	Tyr	His	Val	Leu	Leu	Ser	Asn	Met	
				645					650					655		
tat	gct	agt	gct	gga	aaa	tgg	gaa	gga	gtt	gat	gaa	ata	cgt	tca	ata	2016
Tyr	Ala	Ser	Ala	Gly	Lys	Trp	Glu	Gly	Val	Asp	Glu	Ile	Arg	Ser	Ile	
			660					665					670			
gcc	cat	ggc	aaa	ggg	ttg	agg	aag	aca	ccg	ggg	tgg	agc	tca	atg	gaa	2064
Ala	His	Gly	Lys	Gly	Leu	Arg	Lys	Thr	Pro	Gly	Trp	Ser	Ser	Met	Glu	
		675					680					685				
gta	gac	aac	aaa	gtc	gaa	gtc	ttt	tac	acg	gga	aac	caa	acg	cat	cca	2112
Val	Asp	Asn	Lys	Val	Glu	Val	Phe	Tyr	Thr	Gly	Asn	Gln	Thr	His	Pro	
	690					695					700					
atg	tat	gaa	gag	atg	tac	aga	gaa	tta	acg	gca	tta	caa	gcg	aaa	ctg	2160
Met	Tyr	Glu	Glu	Met	Tyr	Arg	Glu	Leu	Thr	Ala	Leu	Gln	Ala	Lys	Leu	
					710					715					720	

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aag atg att ggg tat gta ccg gac cat aga ttt gtg ttg cag gat gtt 2208  
Lys Met Ile Gly Tyr Val Pro Asp His Arg Phe Val Leu Gln Asp Val  
725 730 735  
gaa gac gac gag aaa gag cat atc ctc atg agt cat agt gaa aga tta 2256  
Glu Asp Asp Glu Lys Glu His Ile Leu Met Ser His Ser Glu Arg Leu  
740 745 750  
gct att gca ttt gca ctt atc gcc act cct gca aag aca acg att cgg 2304  
Ala Ile Ala Phe Ala Leu Ile Ala Thr Pro Ala Lys Thr Thr Ile Arg  
755 760 765  
att ttt aag aat cta agg gta tgc ggc gat tgc cat agc gta acc aag 2352  
Ile Phe Lys Asn Leu Arg Val Cys Gly Asp Cys His Ser Val Thr Lys  
770 775 780  
ttc ata tcg aaa atc act gag aga gag atc att gtg agg gat tca aac 2400  
Phe Ile Ser Lys Ile Thr Glu Arg Glu Ile Ile Val Arg Asp Ser Asn  
785 790 795 800  
cgg ttt cat cat ttc aag aat gga gtc tgc tct tgc ggt gat tac tgg 2448  
Arg Phe His His Phe Lys Asn Gly Val Cys Ser Cys Gly Asp Tyr Trp  
805 810 815  
tga 2451

&lt;210&gt; 44

&lt;211&gt; 816

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 44

Met Leu Arg Gln Ile Pro Thr Cys Lys Gly Gly Arg Phe Thr Arg Val  
1 5 10 15  
Leu Gln Ser Ile Gly Ser Val Ile Arg Glu Phe Ser Ala Ser Ala Asn  
20 25 30  
Ala Leu Gln Asp Cys Trp Lys Asn Gly Asn Glu Ser Lys Glu Ile Asp  
35 40 45  
Asp Val His Thr Leu Phe Arg Tyr Cys Thr Asn Leu Gln Ser Ala Lys  
50 55 60  
Cys Leu His Ala Arg Leu Val Val Ser Lys Gln Ile Gln Asn Val Cys  
65 70 75 80  
Ile Ser Ala Lys Leu Val Asn Leu Tyr Cys Tyr Leu Gly Asn Val Ala  
85 90 95

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Leu Ala Arg His Thr Phe Asp His Ile Gln Asn Arg Asp Val Tyr Ala  
 100 105 110

Trp Asn Leu Met Ile Ser Gly Tyr Gly Arg Ala Gly Asn Ser Ser Glu  
 115 120 125

Val Ile Arg Cys Phe Ser Leu Phe Met Leu Ser Ser Gly Leu Thr Pro  
 130 135 140

Asp Tyr Arg Thr Phe Pro Ser Val Leu Lys Ala Cys Arg Thr Val Ile  
 145 150 155 160

Asp Gly Asn Lys Ile His Cys Leu Ala Leu Lys Phe Gly Phe Met Trp  
 165 170 175

Asp Val Tyr Val Ala Ala Ser Leu Ile His Leu Tyr Ser Arg Tyr Lys  
 180 185 190

Ala Val Gly Asn Ala Arg Ile Leu Phe Asp Glu Met Pro Val Arg Asp  
 195 200 205

Met Gly Ser Trp Asn Ala Met Ile Ser Gly Tyr Cys Gln Ser Gly Asn  
 210 215 220

Ala Lys Glu Ala Leu Thr Leu Ser Asn Gly Leu Arg Ala Met Asp Ser  
 225 230 235 240

Val Thr Val Val Ser Leu Leu Ser Ala Cys Thr Glu Ala Gly Asp Phe  
 245 250 255

Asn Arg Gly Val Thr Ile His Ser Tyr Ser Ile Lys His Gly Leu Glu  
 260 265 270

Ser Glu Leu Phe Val Ser Asn Lys Leu Ile Asp Leu Tyr Ala Glu Phe  
 275 280 285

Gly Arg Leu Arg Asp Cys Gln Lys Val Phe Asp Arg Met Tyr Val Arg  
 290 295 300

Asp Leu Ile Ser Trp Asn Ser Ile Ile Lys Ala Tyr Glu Leu Asn Glu  
 305 310 315 320

Gln Pro Leu Arg Ala Ile Ser Leu Phe Gln Glu Met Arg Leu Ser Arg  
 325 330 335

Ile Gln Pro Asp Cys Leu Thr Leu Ile Ser Leu Ala Ser Ile Leu Ser  
 340 345 350

Gln Leu Gly Asp Ile Arg Ala Cys Arg Ser Val Gln Gly Phe Thr Leu  
 355 360 365

Arg Lys Gly Trp Phe Leu Glu Asp Ile Thr Ile Gly Asn Ala Val Val  
 370 375 380

Val Met Tyr Ala Lys Leu Gly Leu Val Asp Ser Ala Arg Ala Val Phe  
 385 390 395 400

Asn Trp Leu Pro Asn Thr Asp Val Ile Ser Trp Asn Thr Ile Ile Ser  
 405 410 415

Gly Tyr Ala Gln Asn Gly Phe Ala Ser Glu Ala Ile Glu Met Tyr Asn  
 420 425 430

Ile Met Glu Glu Glu Gly Glu Ile Ala Ala Asn Gln Gly Thr Trp Val  
 435 440 445

Ser Val Leu Pro Ala Cys Ser Gln Ala Gly Ala Leu Arg Gln Gly Met  
 450 455 460

Lys Leu His Gly Arg Leu Leu Lys Asn Gly Leu Tyr Leu Asp Val Phe  
 465 470 475 480

Val Val Thr Ser Leu Ala Asp Met Tyr Gly Lys Cys Gly Arg Leu Glu  
 485 490 495

Asp Ala Leu Ser Leu Phe Tyr Gln Ile Pro Arg Val Asn Ser Val Pro  
 500 505 510

Trp Asn Thr Leu Ile Ala Cys His Gly Phe His Gly His Gly Glu Lys  
 515 520 525

Ala Val Met Leu Phe Lys Glu Met Leu Asp Glu Gly Val Lys Pro Asp  
 530 535 540

His Ile Thr Phe Val Thr Leu Leu Ser Ala Cys Ser His Ser Gly Leu  
 545 550 555 560

Val Asp Glu Gly Gln Trp Cys Phe Glu Met Met Gln Thr Asp Tyr Gly  
 565 570 575

Ile Thr Pro Ser Leu Lys His Tyr Gly Cys Met Val Asp Met Tyr Gly  
 580 585 590

Arg Ala Gly Gln Leu Glu Thr Ala Leu Lys Phe Ile Lys Ser Met Ser  
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595

600

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605

Leu Gln Pro Asp Ala Ser Ile Trp Gly Ala Leu Leu Ser Ala Cys Arg  
610 615 620

Val His Gly Asn Val Asp Leu Gly Lys Ile Ala Ser Glu His Leu Phe  
625 630 635 640

Glu Val Glu Pro Glu His Val Gly Tyr His Val Leu Leu Ser Asn Met  
645 650 655

Tyr Ala Ser Ala Gly Lys Trp Glu Gly Val Asp Glu Ile Arg Ser Ile  
660 665 670

Ala His Gly Lys Gly Leu Arg Lys Thr Pro Gly Trp Ser Ser Met Glu  
675 680 685

Val Asp Asn Lys Val Glu Val Phe Tyr Thr Gly Asn Gln Thr His Pro  
690 695 700

Met Tyr Glu Glu Met Tyr Arg Glu Leu Thr Ala Leu Gln Ala Lys Leu  
705 710 715 720

Lys Met Ile Gly Tyr Val Pro Asp His Arg Phe Val Leu Gln Asp Val  
725 730 735

Glu Asp Asp Glu Lys Glu His Ile Leu Met Ser His Ser Glu Arg Leu  
740 745 750

Ala Ile Ala Phe Ala Leu Ile Ala Thr Pro Ala Lys Thr Thr Ile Arg  
755 760 765

Ile Phe Lys Asn Leu Arg Val Cys Gly Asp Cys His Ser Val Thr Lys  
770 775 780

Phe Ile Ser Lys Ile Thr Glu Arg Glu Ile Ile Val Arg Asp Ser Asn  
785 790 795 800

Arg Phe His His Phe Lys Asn Gly Val Cys Ser Cys Gly Asp Tyr Trp  
805 810 815

&lt;210&gt; 45

&lt;211&gt; 3156

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis thaliana

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(3156)

&lt;223&gt;

&lt;400&gt; 45

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Met	Gly	Glu	Glu	Ser	Glu	Ile	Ala	Met	Ala	Ser	Ala	Asp	Arg	Asn	Asn	
1				5					10					15		

cta	acc	cag	aaa	atc	gcc	aag	atc	cta	aac	gag	act	cgc	aca	tca	tac	96
Leu	Thr	Gln	Lys	Ile	Ala	Lys	Ile	Leu	Asn	Glu	Thr	Arg	Thr	Ser	Tyr	
		20						25					30			

gct	act	cat	aac	cgt	aag	cta	aag	gag	ctc	gcc	aca	atc	cgt	tca	aaa	144
Ala	Thr	His	Asn	Arg	Lys	Leu	Lys	Glu	Leu	Ala	Thr	Ile	Arg	Ser	Lys	
		35					40					45				

cta	tct	tca	tct	gaa	tcc	gaa	tcc	gag	tcc	gtg	tct	tct	tct	att	ctt	192
Leu	Ser	Ser	Ser	Glu	Ser	Glu	Ser	Glu	Ser	Val	Ser	Ser	Ser	Ile	Leu	
	50					55					60					

caa	ttc	tct	tcc	gtg	ttt	ctc	aaa	acc	cta	acc	cct	ctt	ttc	atc	gcg	240
Gln	Phe	Ser	Ser	Val	Phe	Leu	Lys	Thr	Leu	Thr	Pro	Leu	Phe	Ile	Ala	
65					70					75					80	

gct	caa	cga	aga	acc	gct	gca	gca	gag	cgt	gtt	gtt	cga	ttc	gtg	gcg	288
Ala	Gln	Arg	Arg	Thr	Ala	Ala	Ala	Glu	Arg	Val	Val	Arg	Phe	Val	Ala	
				85					90					95		

gaa	ttc	gct	tgt	ctt	cgt	agt	aat	tca	gac	ggc	gac	tcc	gat	tgc	gac	336
Glu	Phe	Ala	Cys	Leu	Arg	Ser	Asn	Ser	Asp	Gly	Asp	Ser	Asp	Cys	Asp	
			100					105					110			

gag	ttt	cta	gag	gaa	ttt	ctt	aag	ttt	ttg	gtt	gct	ggg	tct	gtt	gct	384
Glu	Phe	Leu	Glu	Glu	Phe	Leu	Lys	Phe	Leu	Val	Ala	Gly	Ser	Val	Ala	
		115					120					125				

gcc	aat	aga	aac	gcg	aga	ttc	agg	gcg	tgt	cag	ata	att	tca	gag	atc	432
Ala	Asn	Arg	Asn	Ala	Arg	Phe	Arg	Ala	Cys	Gln	Ile	Ile	Ser	Glu	Ile	
	130					135					140					

ata	ttg	agg	ctg	cca	gat	gaa	gtg	gaa	gta	gcg	gat	gaa	cta	tgg	gat	480
Ile	Leu	Arg	Leu	Pro	Asp	Glu	Val	Glu	Val	Ala	Asp	Glu	Leu	Trp	Asp	
145					150					155					160	

gat	gta	att	gat	tgt	atg	atg	ttg	cga	gtt	cgg	gac	aaa	gtt	cct	gtt	528
Asp	Val	Ile	Asp	Cys	Met	Met	Leu	Arg	Val	Arg	Asp	Lys	Val	Pro	Val	
				165					170					175		

ata	cgt	aca	ttt	gct	gtg	agg	tct	ctt	tca	cgt	ttt	gtg	aat	gat	cct	576
Ile	Arg	Thr	Phe	Ala	Val	Arg	Ser	Leu	Ser	Arg	Phe	Val	Asn	Asp	Pro	
			180					185					190			

gag	aat	agt	gac	att	ctt	gat	ttg	cta	ctt	gag	gtg	ctt	cct	ttg	gaa	624
Glu	Asn	Ser	Asp	Ile	Leu	Asp	Leu	Leu	Leu	Glu	Val	Leu	Pro	Leu	Glu	

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195				200				205								
cag Gln	aat Asn 210	ccg Pro	gag Glu	gta Val	cgc Arg	aaa Lys 215	aca Thr	att Ile	gtt Val	tta Leu	tct Ser 220	ctg Leu	cct Pro	cct Pro	tca Ser	672
aat Asn 225	gca Ala	acc Thr	acc Thr	caa Gln	gca Ala 230	att Ile	att Ile	gat Asp	tgc Cys	acg Thr 235	ctc Leu	gat Asp	gtt Val	aat Asn	gaa Glu 240	720
tca Ser	gta Val	cgc Arg	aaa Lys	gca Ala 245	gct Ala	tac Tyr	tct Ser	gtt Val	ctg Leu 250	gct Ala	aat Asn	aaa Lys	gtt Val	cct Pro 255	ctt Leu	768
cag Gln	agt Ser	ctg Leu	agc Ser 260	atc Ile	aag Lys	cta Leu	agg Arg	acc Thr 265	aca Thr	att Ile	ctt Leu	cag Gln	aga Arg 270	ggg Gly	ctc Leu	816
gct Ala	gat Asp	cgt Arg 275	gct Ala	gta Val	aat Asn	gtt Val	tca Ser 280	acg Thr	gaa Glu	tgc Cys	ttg Leu	aag Lys 285	cta Leu	atg Met	aaa Lys	864
gag Glu	caa Gln 290	tgg Trp	cta Leu	gct Ala	aac Asn	tat Tyr 295	tgt Cys	gaa Glu	gga Gly	gat Asp	cct Pro 300	atc Ile	aca Thr	ttt Phe	ctt Leu	912
aaa Lys 305	tac Tyr	ctt Leu	gac Asp	gtt Val	gaa Glu 310	acc Thr	tac Tyr	gaa Glu	tct Ser	gtg Val 315	gca Ala	gaa Glu	tcg Ser	gcg Ala	ttg Leu 320	960
gaa Glu	gtt Val	ctg Leu	ttg Leu	agt Ser 325	gaa Glu	ggg Gly	ttg Leu	ata Ile	atg Met 330	ccc Pro	tcc Ser	gat Asp	gat Asp	aaa Lys 335	agc Ser	1008
atc Ile	cag Gln	cag Gln	tac Tyr 340	ata Ile	ttg Leu	tca Ser	gca Ala	gat Asp 345	ggt Gly	gaa Glu	act Thr	aga Arg	gat Asp 350	gaa Glu	agc Ser	1056
aca Thr	tgt Cys	tct Ser 355	gca Ala	ccc Pro	agc Ser	att Ile	caa Gln 360	ctt Leu	atg Met	gag Glu	cca Pro	gag Glu 365	att Ile	gct Ala	ctt Leu	1104
tac Tyr	tgg Trp 370	agg Arg	att Ile	ata Ile	tgc Cys	agg Arg 375	aag Lys	gtg Val	cac His	caa Gln	agt Ser 380	gct Ala	caa Gln	gca Ala	aaa Lys	1152
ggt Gly 385	tct Ser	gat Asp	gct Ala	gct Ala	aca Thr 390	gcg Ala	atg Met	ggt Gly	gct Ala	gaa Glu 395	gca Ala	gca Ala	gtt Val	tat Tyr	gct Ala 400	1200
gct Ala	gaa Glu	gct Ala	tca Ser	gat Asp 405	gct Ala	aat Asn	gat Asp	ttg Leu	ctg Leu 410	gaa Glu	aga Arg	att Ile	ctt Leu	cct Pro 415	gca Ala	1248
aca Thr	gtt Val	tct Ser	gat Asp 420	tat Tyr	gtt Val	gat Asp	cta Leu	gtt Val 425	aaa Lys	gct Ala	cat His	ata Ile	gaa Glu 430	gca Ala	gga Gly	1296
cca Pro	aat Asn	cat His 435	cac His	ttt Phe	gct Ala	tcg Ser 440	agg Arg	cag Gln	cta Leu	tta Leu	ttg Leu	ttg Leu 445	ggt Gly	acg Thr	atg Met	1344
ctt Gln	gat Ser	ttc Leu	tct Leu	gat Ser	gct Ser	atg Ser	ctc Ser	cac Ser	aag Ser	act Ser	gtg Ser	agc Ser	tca Ser	ttt Ser	gtc Ser	1392

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Gln	Glu	Leu	Leu	Arg	Arg	Pro	Phe	Glu	Gln	Glu	Leu	Asp	Glu	Asp	Gly	
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aac	agt	att	gtg	att	gga	gat	ggt	ata	aac	ctt	ggt	ggt	gat	aaa	gat	1488
Asn	Ser	Ile	Val	Ile	Gly	Asp	Gly	Ile	Asn	Leu	Gly	Gly	Asp	Lys	Asp	
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tgg	gct	gag	gca	gtg	tcg	aaa	ttg	gct	aaa	aaa	gtc	cat	gct	gcc	cct	1536
Trp	Ala	Glu	Ala	Val	Ser	Lys	Leu	Ala	Lys	Lys	Val	His	Ala	Ala	Pro	
			500					505					510			
gga	gaa	tat	gaa	gaa	gtt	ata	ctt	gtt	gtt	gtt	gaa	gaa	gta	gca	aga	1584
Gly	Glu	Tyr	Glu	Glu	Val	Ile	Leu	Val	Val	Val	Glu	Glu	Val	Ala	Arg	
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ccc	tgc	agg	gaa	agg	act	gcg	gat	ttc	ctg	cag	tgg	atg	cac	atg	ctt	1632
Pro	Cys	Arg	Glu	Arg	Thr	Ala	Asp	Phe	Leu	Gln	Trp	Met	His	Met	Leu	
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Gln	Gly	Lys	Ala	Ile	Glu	Pro	Glu	Glu	Ile	Leu	His	Ala	Leu	Leu	Leu	
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Pro	Gly	Ala	Lys	His	Thr	His	Leu	Asp	Val	Gln	Arg	Ile	Ala	Ile	Lys	
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Gly	Leu	Gly	Leu	Phe	Gly	Leu	Leu	Glu	Lys	Lys	Pro	Ser	Glu	Glu	Leu	
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Val	Arg	Gln	Leu	Arg	Ala	Ala	Phe	Cys	Arg	Ser	Pro	Pro	Pro	Ile	Ser	
	610					615					620					
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Ile	Met	Ala	Cys	Lys	Ala	Leu	Val	Asp	Leu	Gly	Met	Trp	His	Ser	Pro	
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Thr	Glu	Val	Asp	Lys	Ala	Met	Gly	Gln	Asp	Leu	Leu	Ser	Gln	Phe	Glu	
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Asp	Met	Asn	Phe	Lys	Met	Leu	Asp	Leu	Leu	Tyr	Ala	Gly	Leu	Glu	Ser	
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gat	gac	tgg	aga	gca	tcc	aca	gag	agc	agt	gag	aat	gag	tca	gtt	aaa	2112
Asp	Asp	Trp	Arg	Ala	Ser	Thr	Glu	Ser	Ser	Glu	Asn	Glu	Ser	Val	Lys	
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tac Tyr	cca Pro	aac Asn	ttg Leu	cct Pro 725	gca Ala	tct Ser	ttc Phe	tat Tyr	ccg Pro 730	ttt Phe	gta Val	ttg Leu	gga Gly	aag Lys 735	cta Leu	2208
att Ile	gct Ala	tta Leu	tat Tyr 740	ttc Phe	agt Ser	gag Glu	gag Glu	tca Ser 745	aaa Lys	gaa Glu	caa Gln	ctg Leu	agg Arg 750	ttt Phe	aaa Lys	2256
cag Gln	tgt Cys	tta Leu 755	tcc Ser	gtc Val	ttc Phe	ttt Phe	gag Glu 760	cac His	tat Tyr	gcc Ala	tcc Ser	ctc Leu 765	tca Ser	gaa Glu	aaa Lys	2304
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tgg Trp 785	cct Pro	ggg Gly	att Ile	gat Asp 790	gga Gly	aac Asn	act Thr	aaa Lys	agt Ser	tcg Ser 795	tca Ser	tat Tyr	gtt Val	gta Val	tca Ser 800	2400
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cag Gln	gtc Val	aat Asn 835	aaa Lys	tca Ser	cca Pro	gaa Glu	gat Asp 840	tct Ser	atc Ile	caa Gln	cat His	cca Pro 845	cta Leu	aac Asn	tgt Cys	2544
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gag Glu	aag Lys	gat Asp 915	ctt Leu	ctt Leu	aaa Lys	gaa Glu	gtg Val 920	aaa Lys	ccg Pro	gtg Val	ctt Leu	caa Gln	cat His	cta Leu	aaa Lys	2784
tct Ser	ttg Leu 930	gat Asp	gct Ala	tgt Cys	cca Pro	agc Ser 935	gag Glu	gag Glu	ctt Leu	aca Thr	caa Gln	gat Asp	caa Gln	gca Ala	aat Asn	2832
tcc Ser 945	atc Ile	ttt Phe	gaa Glu	ata Ile	ctc Leu 950	gga Gly	gtt Val	agc Ser	tac Tyr	aac Asn 955	tta Leu	gag Glu	atc Ile	act Thr	gaa Glu 960	2880

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 965 970 975

cgg tca aga aga cga gca agg att gaa gaa aca tcc tct gat gaa gaa 2976  
 Arg Ser Arg Arg Arg Ala Arg Ile Glu Glu Thr Ser Ser Asp Glu Glu  
 980 985 990

gaa gta gca tct cct cca cct tct gct cct aat act ttg atg acc cga 3024  
 Glu Val Ala Ser Pro Pro Pro Ser Ala Pro Asn Thr Leu Met Thr Arg  
 995 1000 1005

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 35 40 45

Leu Ser Ser Ser Glu Ser Glu Ser Glu Ser Val Ser Ser Ser Ile Leu  
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Gln Phe Ser Ser Val Phe Leu Lys Thr Leu Thr Pro Leu Phe Ile Ala  
 65 70 75 80

Ala Gln Arg Arg Thr Ala Ala Ala Glu Arg Val Val Arg Phe Val Ala  
 85 90 95

Glu Phe Ala Cys Leu Arg Ser Asn Ser Asp Gly Asp Ser Asp Cys Asp  
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100

105

110

Glu Phe Leu<sub>115</sub> Glu Glu Phe Leu Lys<sub>120</sub> Phe Leu Val Ala Gly<sub>125</sub> Ser Val Ala

Ala Asn<sub>130</sub> Arg Asn Ala Arg Phe<sub>135</sub> Arg Ala Cys Gln Ile<sub>140</sub> Ile Ser Glu Ile

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Ile Arg Thr Phe<sub>180</sub> Ala Val Arg Ser Leu<sub>185</sub> Ser Arg Phe Val Asn<sub>190</sub> Asp Pro

Glu Asn Ser<sub>195</sub> Asp Ile Leu Asp Leu<sub>200</sub> Leu Leu Glu Val Leu<sub>205</sub> Pro Leu Glu

Gln Asn Pro Glu Val Arg Lys<sub>215</sub> Thr Ile Val Leu Ser<sub>220</sub> Leu Pro Pro Ser

Asn Ala Thr Thr Gln Ala<sub>230</sub> Ile Ile Asp Cys Thr<sub>235</sub> Leu Asp Val Asn Glu<sub>240</sub>

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Gln Ser Leu Ser<sub>260</sub> Ile Lys Leu Arg Thr<sub>265</sub> Thr Ile Leu Gln Arg<sub>270</sub> Gly Leu

Ala Asp Arg Ala Val Asn Val Ser<sub>280</sub> Thr Glu Cys Leu Lys<sub>285</sub> Leu Met Lys

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Lys Tyr Leu Asp Val Glu<sub>310</sub> Thr Tyr Glu Ser Val<sub>315</sub> Ala Glu Ser Ala Leu<sub>320</sub>

Glu Val Leu Leu Ser<sub>325</sub> Glu Gly Leu Ile Met<sub>330</sub> Pro Ser Asp Asp Lys<sub>335</sub> Ser

Ile Gln Gln Tyr<sub>340</sub> Ile Leu Ser Ala Asp<sub>345</sub> Gly Glu Thr Arg Asp<sub>350</sub> Glu Ser

Thr Cys Ser Ala Pro Ser Ile Gln Leu Met Glu Pro Glu Ile Ala Leu  
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Tyr Trp Arg Ile Ile Cys Arg Lys Val His Gln Ser Ala Gln Ala Lys  
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Gly Ser Asp Ala Ala Thr Ala Met Gly Ala Glu Ala Ala Val Tyr Ala  
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Ala Glu Ala Ser Asp Ala Asn Asp Leu Leu Glu Arg Ile Leu Pro Ala  
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Pro Asn His His Phe Ala Ser Arg Gln Leu Leu Leu Leu Gly Thr Met  
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Trp Ala Glu Ala Val Ser Lys Leu Ala Lys Lys Val His Ala Ala Pro  
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Pro Gly Ala Lys His Thr His Leu Asp Val Gln Arg Ile Ala Ile Lys  
 580 585 590

Gly Leu Gly Leu Phe Gly Leu Leu Glu Lys Lys Pro Ser Glu Glu Leu  
 595 600 605



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Ile Met Ala Cys Lys Ala Leu Val Asp Leu Gly Met Trp His Ser Pro  
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Asp Met Asn Phe Lys Met Leu Asp Leu Leu Tyr Ala Gly Leu Glu Ser  
675 680 685

Asp Asp Trp Arg Ala Ser Thr Glu Ser Ser Glu Asn Glu Ser Val Lys  
690 695 700

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Tyr Pro Asn Leu Pro Ala Ser Phe Tyr Pro Phe Val Leu Gly Lys Leu  
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Gln Cys Leu Ser Val Phe Phe Glu His Tyr Ala Ser Leu Ser Glu Lys  
755 760 765

His Lys Gly Tyr Val Ser Lys Ala Phe Val Pro Leu Val Arg Ser Met  
770 775 780

Trp Pro Gly Ile Asp Gly Asn Thr Lys Ser Ser Ser Tyr Val Val Ser  
785 790 795 800

Asn Gln Arg Lys Arg Ala Val Gln Val Ser Arg Phe Ile Leu Gln Met  
805 810 815

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820 825 830

Gln Val Asn Lys Ser Pro Glu Asp Ser Ile Gln His Pro Leu Asn Cys  
835 840 845

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865 870 875 880

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Lys Leu Leu Lys Lys Leu Leu Ser Leu Leu Ala Asp Ser Val Arg Ser  
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Ser Ile Phe Glu Ile Leu Gly Val Ser Tyr Asn Leu Glu Ile Thr Glu  
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980 985 990

Glu Val Ala Ser Pro Pro Pro Ser Ala Pro Asn Thr Leu Met Thr Arg  
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Phe	Glu	Met	Glu	Leu	Gln	Glu	Leu	Phe	Asn	Glu	Val	Lys	Ser	Met	Val	
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gca Ala	gaa Glu	cga Arg	ttg Leu 420	cta Leu	cga Arg	act Thr	tgt Cys	ttg Leu 425	aac Asn	atc Ile	atg Met	gag Glu	gta Val 430	tca Ser	gtt Val	1296
ggc Gly	tca Ser	gaa Glu 435	ggt Gly	cag Gln	tcc Ser	ata Ile	acc Thr 440	ttc Phe	cca Pro	atg Met	cta Leu	aat Asn 445	ctt Leu	gca Ala	gtc Val	1344
act Thr 450	ctt Leu	tcc Ser	caa Gln	ctg Leu	aat Asn 455	cgt Arg	gat Asp	gag Glu	gaa Glu	gcc Ala 460	gag Glu	caa Gln	ata Ile	gcc Ala	tta Leu	1392
aag Lys	gtt Val	cta Leu	cgc Arg	atc Ile	cgt Arg	gag Glu	aag Lys	gca Ala	ttt Phe	ggc Gly	gaa Glu	gac Asp	tct Ser	ctc Leu	cct Pro	1440

## 70166USNP.ST25

465		470		475		480	
gtt gga gag gcg ctg gac tgt ttg gta tcg atc caa gcg aga cta gga							1488
Val Gly Glu Ala Leu Asp Cys Leu Val Ser Ile Gln Ala Arg Leu Gly							
			485			490	
aga gat gat gga gaa ata ttg ggt ttg ctg aaa agg gtt atg atg atc							1536
Arg Asp Asp Gly Glu Ile Leu Gly Leu Leu Lys Arg Val Met Met Ile							
			500			510	
caa gag aaa gag ttt ggt cct tca gct caa gaa ctc att gtt act ctc							1584
Gln Glu Lys Glu Phe Gly Pro Ser Ala Gln Glu Leu Ile Val Thr Leu							
			515			525	
cag aag atc att cat ttc ttg gag aaa ttg gag atg aaa gat gat aaa							1632
Gln Lys Ile Ile His Phe Leu Glu Lys Leu Glu Met Lys Asp Asp Lys							
			530			540	
ttt aag ttt agg aga aga tta gct tta ctt aga gag aga tac aag cag							1680
Phe Lys Phe Arg Arg Arg Leu Ala Leu Leu Arg Glu Arg Tyr Lys Gln							
			545			555	560
agt ctt agc tac tag							1695
Ser Leu Ser Tyr							

&lt;210&gt; 48

&lt;211&gt; 564

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 48

Met Val Phe Ser Asn Ser Leu Leu Ser Ser Thr Thr Ser Leu Thr Thr															
1				5				10					15		
Trp Ala Asn Gln Ser Ser Ser Gln Ser Ser Leu Ser Pro Arg Tyr Ser															
			20				25					30			
Thr Trp Gln Cys Val Cys Leu Arg Asn Gln Lys Arg Lys Pro Lys Leu															
			35				40					45			
Tyr Leu Ile Pro Ala Arg His Phe Leu Ser Thr Pro Ile Asp Ser Val															
			50			55				60					
Ser Ser Ser Ser Ile Thr Ala Ser Arg Tyr Ala Thr Ser Gly Val Ser															
65					70				75					80	
Glu Val Gln Arg Ser Thr Ser Ser Asn Asn Val Thr Glu Met Glu Glu															
				85				90					95		

## 70166USNP.ST25

Phe Glu Met Glu Leu Gln Glu Leu Phe Asn Glu Val Lys Ser Met Val  
 100 105 110

Lys Ile Gly Lys Glu Ser Asp Ala Met Asp Leu Leu Arg Ala Asn Tyr  
 115 120 125

Val Ala Val Lys Glu Glu Leu Asp Ser Gly Leu Lys Gly Ile Glu Gln  
 130 135 140

Ala Ala Val Leu Asp Ile Ile Ala Leu Gly Tyr Met Ala Val Gly Asp  
 145 150 155 160

Leu Lys Pro Val Pro Ala Leu Leu Asp Met Ile Asn Lys Ile Val Asp  
 165 170 175

Asn Leu Lys Asp Ser Glu Pro Leu Leu Asp Ser Val Leu Met His Val  
 180 185 190

Gly Ser Met Tyr Ser Val Ile Gly Lys Phe Glu Asn Ala Ile Leu Val  
 195 200 205

His Gln Arg Ala Ile Arg Ile Leu Glu Asn Arg Tyr Gly Lys Cys Asn  
 210 215 220

Thr Leu Leu Val Thr Pro Leu Leu Gly Met Ala Lys Ser Phe Ala Ser  
 225 230 235 240

Asp Gly Lys Ala Thr Lys Ala Ile Gly Val Tyr Glu Arg Thr Leu Thr  
 245 250 255

Ile Leu Glu Arg Asn Arg Gly Ser Glu Ser Glu Asp Leu Val Val Pro  
 260 265 270

Leu Phe Ser Leu Gly Lys Leu Leu Leu Lys Glu Gly Lys Ala Ala Glu  
 275 280 285

Ala Glu Ile Pro Phe Thr Ser Ile Val Asn Ile Tyr Lys Lys Ile Tyr  
 290 295 300

Gly Glu Arg Asp Gly Arg Val Gly Met Ala Met Cys Ser Leu Ala Asn  
 305 310 315 320

Ala Lys Cys Ser Lys Gly Asp Ala Asn Glu Ala Val Asp Ile Tyr Arg  
 325 330 335

Asn Ala Leu Arg Ile Ile Lys Asp Ser Asn Tyr Met Thr Ile Asp Asn  
 340 345 350

## 70166USNP.ST25

Ser Ile Leu Glu Asn Met Arg Ile Asp Leu Ala Glu Leu Leu His Phe  
 355 360 365

Val Gly Arg Gly Asp Glu Gly Arg Glu Leu Leu Glu Glu Cys Leu Leu  
 370 375 380

Ile Asn Glu Arg Phe Lys Gly Lys Asn His Pro Ser Met Ala Thr His  
 385 390 395 400

Leu Ile Asn Leu Ala Ala Ser Tyr Ser Arg Ser Lys Asn Tyr Val Glu  
 405 410 415

Ala Glu Arg Leu Leu Arg Thr Cys Leu Asn Ile Met Glu Val Ser Val  
 420 425 430

Gly Ser Glu Gly Gln Ser Ile Thr Phe Pro Met Leu Asn Leu Ala Val  
 435 440 445

Thr Leu Ser Gln Leu Asn Arg Asp Glu Glu Ala Glu Gln Ile Ala Leu  
 450 455 460

Lys Val Leu Arg Ile Arg Glu Lys Ala Phe Gly Glu Asp Ser Leu Pro  
 465 470 475 480

Val Gly Glu Ala Leu Asp Cys Leu Val Ser Ile Gln Ala Arg Leu Gly  
 485 490 495

Arg Asp Asp Gly Glu Ile Leu Gly Leu Leu Lys Arg Val Met Met Ile  
 500 505 510

Gln Glu Lys Glu Phe Gly Pro Ser Ala Gln Glu Leu Ile Val Thr Leu  
 515 520 525

Gln Lys Ile Ile His Phe Leu Glu Lys Leu Glu Met Lys Asp Asp Lys  
 530 535 540

Phe Lys Phe Arg Arg Arg Leu Ala Leu Leu Arg Glu Arg Tyr Lys Gln  
 545 550 555 560

Ser Leu Ser Tyr

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<211> 18

<212> DNA

<213> artificial sequence

<220>

<223> primer

<220>

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<222> (1)..(18)

<223>

<220>

<221> misc\_feature

<222> (1)..(18)

<223> n=a, t, g or c

<400> 49  
ngttgwgnat wtsgwgnt

18

<210> 50

<211> 16

<212> DNA

<213> artificial sequence

<220>

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<222> (1)..(16)

<223>

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<221> misc\_feature

<222> (1)..(16)

<223> n=a, t, g or c



<400> 50  
ngtcgaswga nawgaa

16

<210> 51

<211> 16

<212> DNA

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<220>

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<222> (1)..(16)

<223>

<220>

<221> misc\_feature

<222> (1)..(16)

<223> n=a, t, g or c

<400> 51  
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16

<210> 52

<211> 16

<212> DNA

<213> artificial sequence

<220>

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<222> (1)..(16)

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<223> n= a, t, g or c

<400> 52  
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16

<210> 53

<211> 16

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<223> n=a, t, g, or c

<400> 53  
sttgntastn cnttgc

16

<210> 54

<211> 15

<212> DNA

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<223> n=a, t, g or c

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15

<210> 55

<211> 16

<212> DNA

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<220>

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<222> (1)..(16)

<223> n=a, t, g or c

<400> 55  
wgtgnagwan canaga

16

<210> 56

<211> 30

<212> DNA

<213> artificial sequence

<220>

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<222> (1)..(30)

<223>

<400> 56  
actagctcta ccgtttccgt ttccgtttac

30

<210> 57

<211> 30

<212> DNA

<213> artificial sequence

<220>

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<222> (1)..(30)

<223>

<400> 57  
ttacctcggg ttcgaaatcg atcgggataa

30

<210> 58

<211> 33

<212> DNA

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<222> (1)..(33)

<223>

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aaaatcgggtt atacgataac ggtcggtacg gga

33

<210> 59

<211> 36

<212> DNA

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<220>

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<222> (1)..(36)

<223>

<400> 59  
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36

<210> 60

<211> 37

<212> DNA

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<222> (1)..(37)

<223>

<400> 60  
taccgaagaa aaataccggt tcccgtccga tttcgac

37

<210> 61

<211> 34

<212> DNA

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<220>

<223> primer

<220>

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<222> (1)..(34)

<223>

<400> 61  
ggatcgtatc ggttttcgat taccgtattt atcc

34

<210> 62

<211> 29

<212> DNA

<213> artificial sequence

<220>

<223> primer

<220>

<221> misc\_feature

<222> (1)..(29)

<223>

<400> 62  
attaggcacc ccaggcttta cactttatg

29

<210> 63

<211> 30  
<212> DNA  
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<220>  
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<223>

<400> 63  
gtatgttg tggaattgtg agcggataac

30

<210> 64  
<211> 30  
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<220>  
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<400> 64  
taacaatttc acacaggaaa cagctatgac

30

<210> 65  
<211> 34  
<212> DNA  
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<220>

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<222> (1)..(34)

<223>

<400> 65  
tagcatctga atttcataac caatctcgat acac

34

<210> 66

<211> 34

<212> DNA

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<222> (1)..(34)

<223>

<400> 66  
gcttcctatt atatcttccc aaattaccaa taca

34

<210> 67

<211> 34

<212> DNA

<213> artificial sequence

<220>

<223> primer

<220>



<221> misc\_feature

<222> (1)..(34)

<223>

<400> 67

gccttttcag aaatggataa atagccttgc ttcc

34

<210> 68

<211> 32

<212> DNA

<213> artificial sequence

<220>

<223> primer

<220>

<221> misc\_feature

<222> (1)..(32)

<223>

<400> 68

caaactagga taaattatcg cgcgcggtgt ca

32

<210> 69

<211> 32

<212> DNA

<213> artificial sequence

<220>

<223> primer

<220>

<221> misc\_feature

<222> (1)..(32)

<223>

<400> 69  
ggtgtcatct atgttactag atcggaatt ga

32

<210> 70

<211> 30

<212> DNA

<213> artificial sequence

<220>

<223> primer

<220>

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<222> (1)..(30)

<223>

<400> 70  
cgccatggca tatgctagca tgcataattc

30

<210> 71

<211> 35

<212> DNA

<213> artificial sequence

<220>

<223> primer

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<222> (1)..(35)

<223>

<400> 71  
aattggaat tactctttct ttctctccat attga

35

<210> 72

<211> 31  
<212> DNA  
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<220>  
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<222> (1)..(31)  
<223>

<400> 72  
atattgacca tcatactcat tgctgatcca t

31

<210> 73  
<211> 28  
<212> DNA  
<213> artificial sequence

<220>  
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<222> (1)..(28)  
<223>

<400> 73  
tgatccatgt agatttcccg gacatgaa

28